

APPENDIX A

References

REFERENCES

Washington State Department of Transportation (WSDOT)

- WSDOT Ferries Division. 2004. *Mukilteo Multimodal Terminal Master Plan Design Report*, Washington State Department of Transportation, Seattle, WA.
- WSDOT Ferries Division. 2006. *Mukilteo Multimodal Ferry Terminal Civil Design Criteria Technical Memorandum*, Washington State Department of Transportation, Seattle, WA.
- WSDOT Ferries Division. 2009. *Final Long-Range Plan*, Washington State Department of Transportation, Seattle, WA.
- WSDOT Ferries Division. *Life Cycle Cost Model 2007 Update*, Washington State Department of Transportation, Seattle, WA.
- WSDOT Ferries Division. *WSF Traffic Statistics 2010*, Washington State Department of Transportation, Seattle, WA.
- WSDOT. *Pavement Policy*, Washington State Department of Transportation, Olympia, WA.
- WSDOT Environmental & Engineering Programs Division. 2011. *Vashon Ferry Terminal Timber Trestle Replacement Preliminary Geotechnical Report*, Washington State Department of Transportation, Olympia, WA.

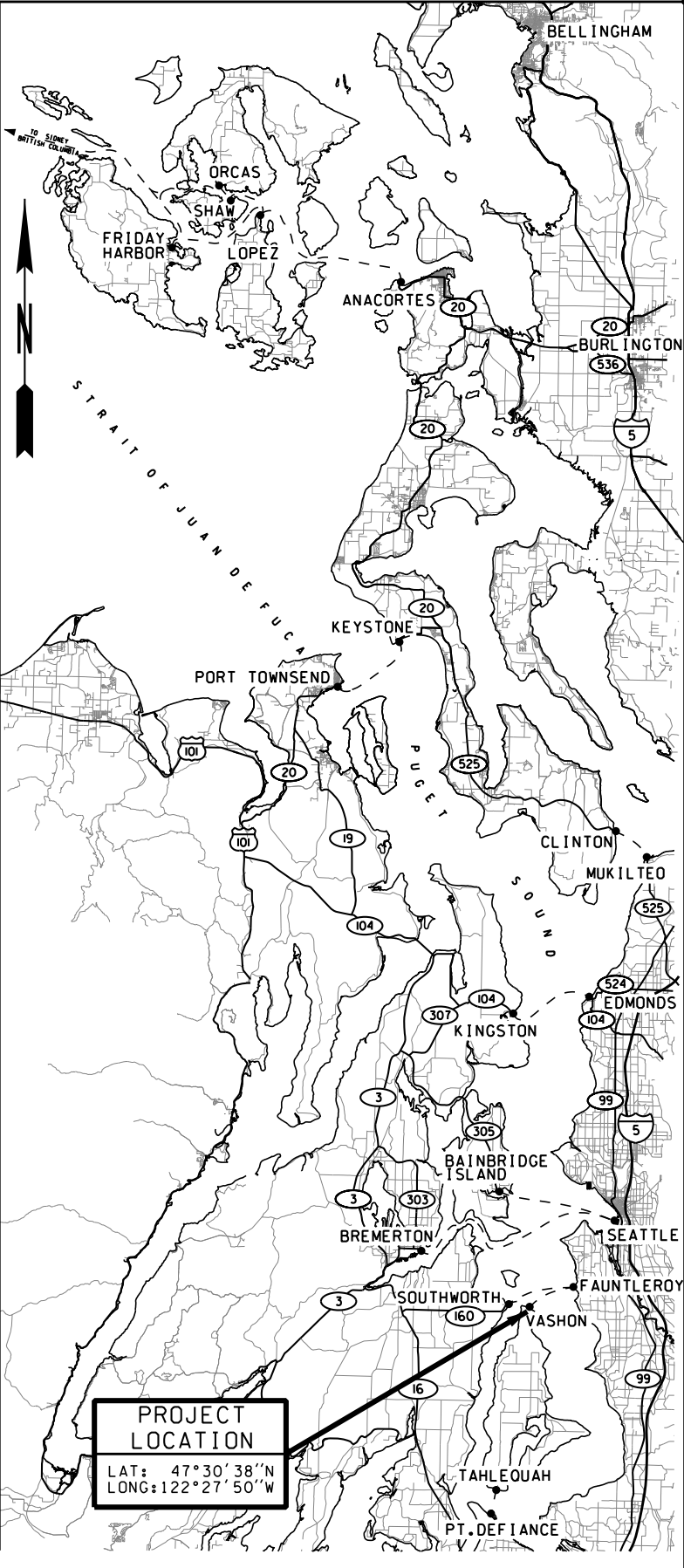
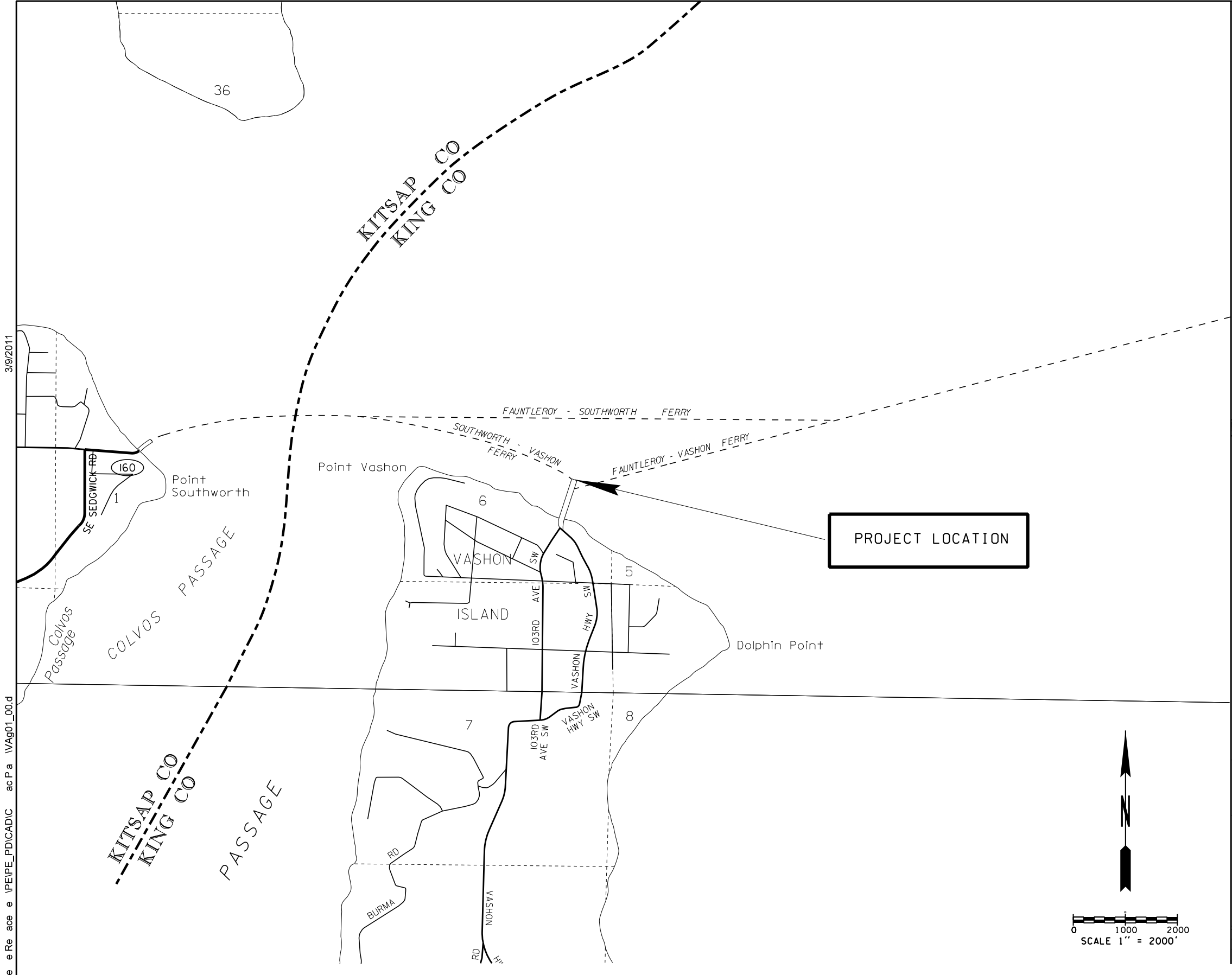
Condition Assessment

APPENDIX B

Site Plans

3/9/2011

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Washington State
Department of Transportation

WASHINGTON STATE FERRIES

VASHON FERRY TERMINAL TRESTLE REPLACEMENT

VICINITY MAP

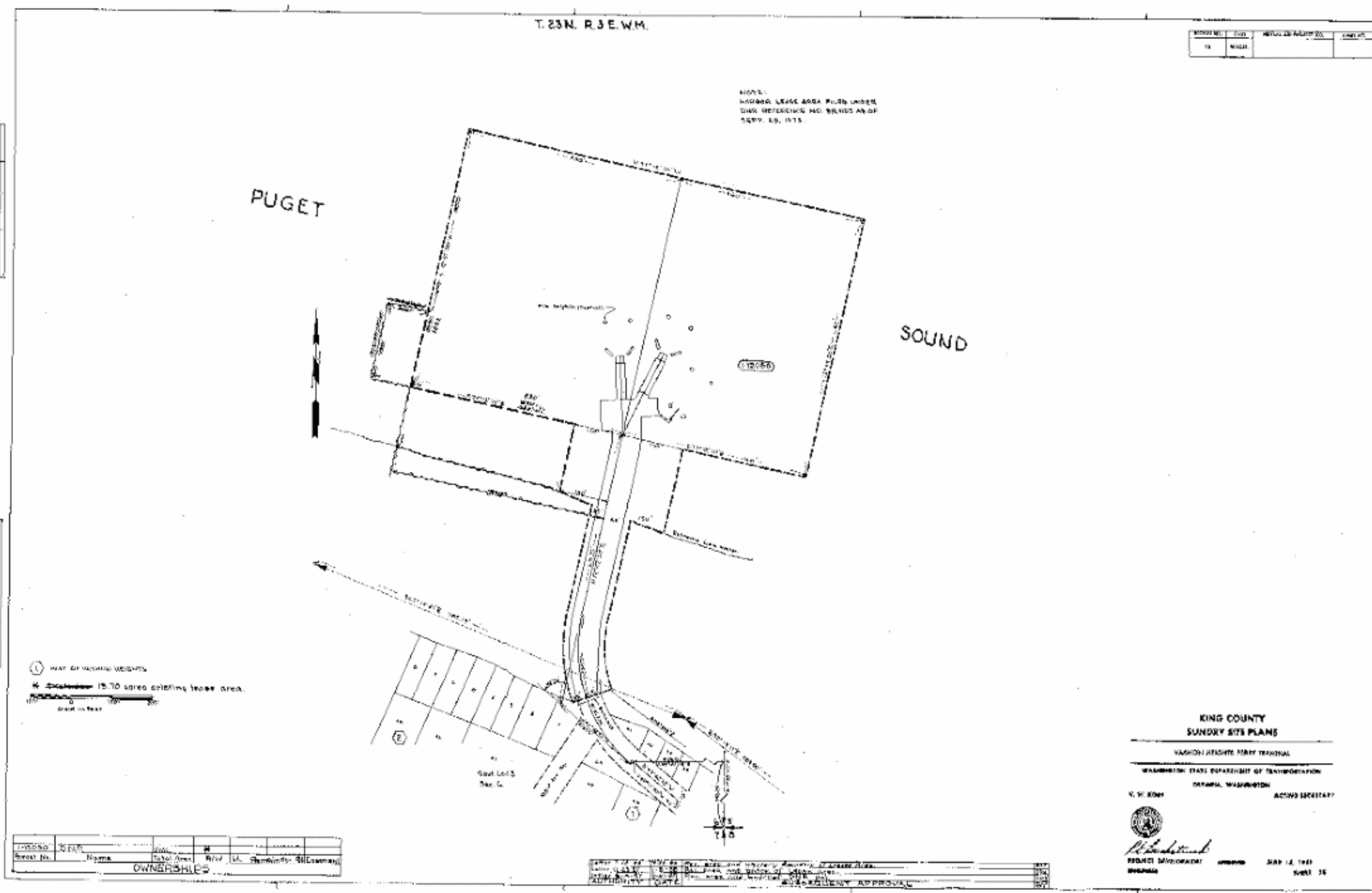
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FIGURE X

3/10/2011

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Washington State
Department of Transportation

WASHINGTON STATE FERRIES

VASHON FERRY TERMINAL TRESTLE REPLACEMENT

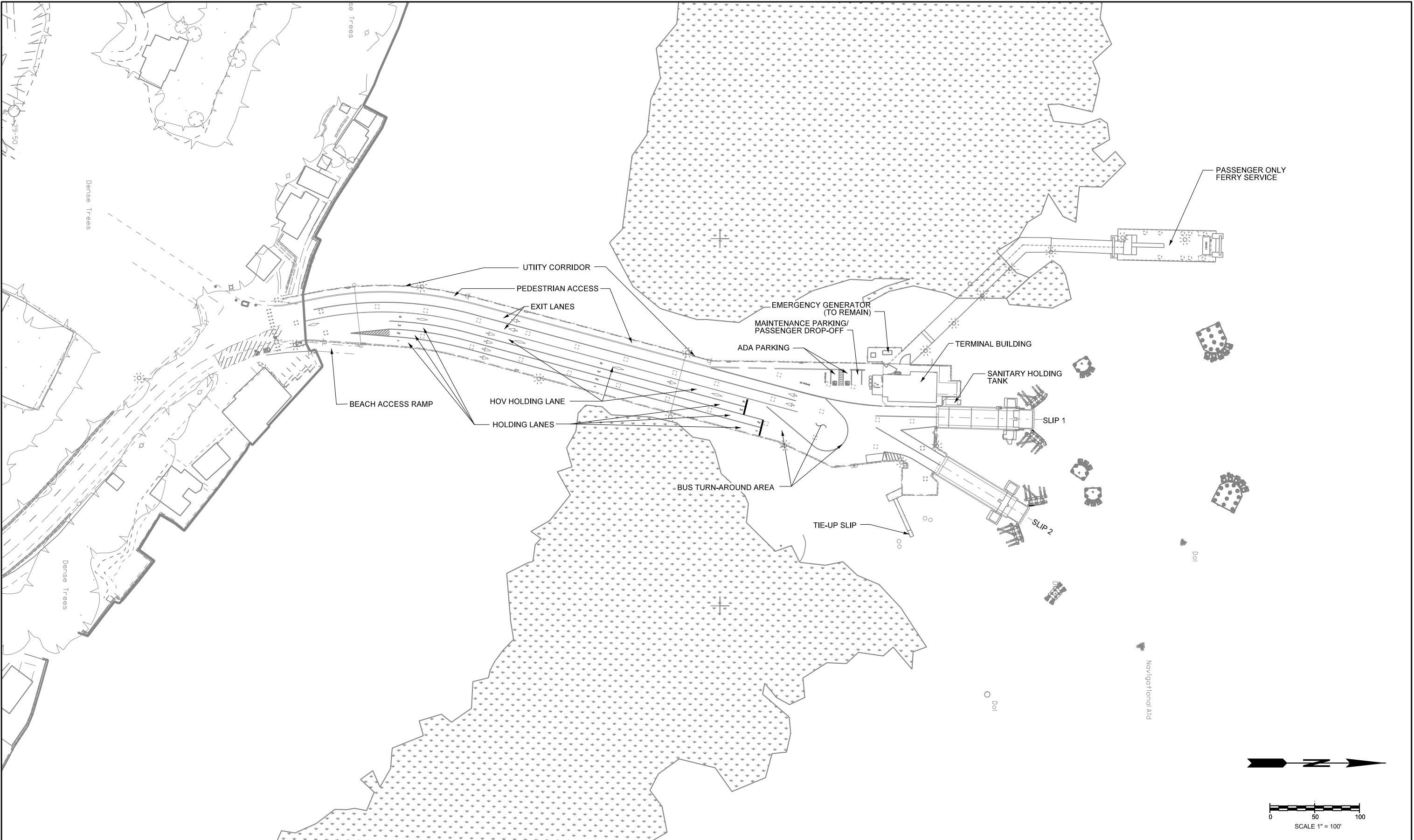
SUNDY SITE PLAN

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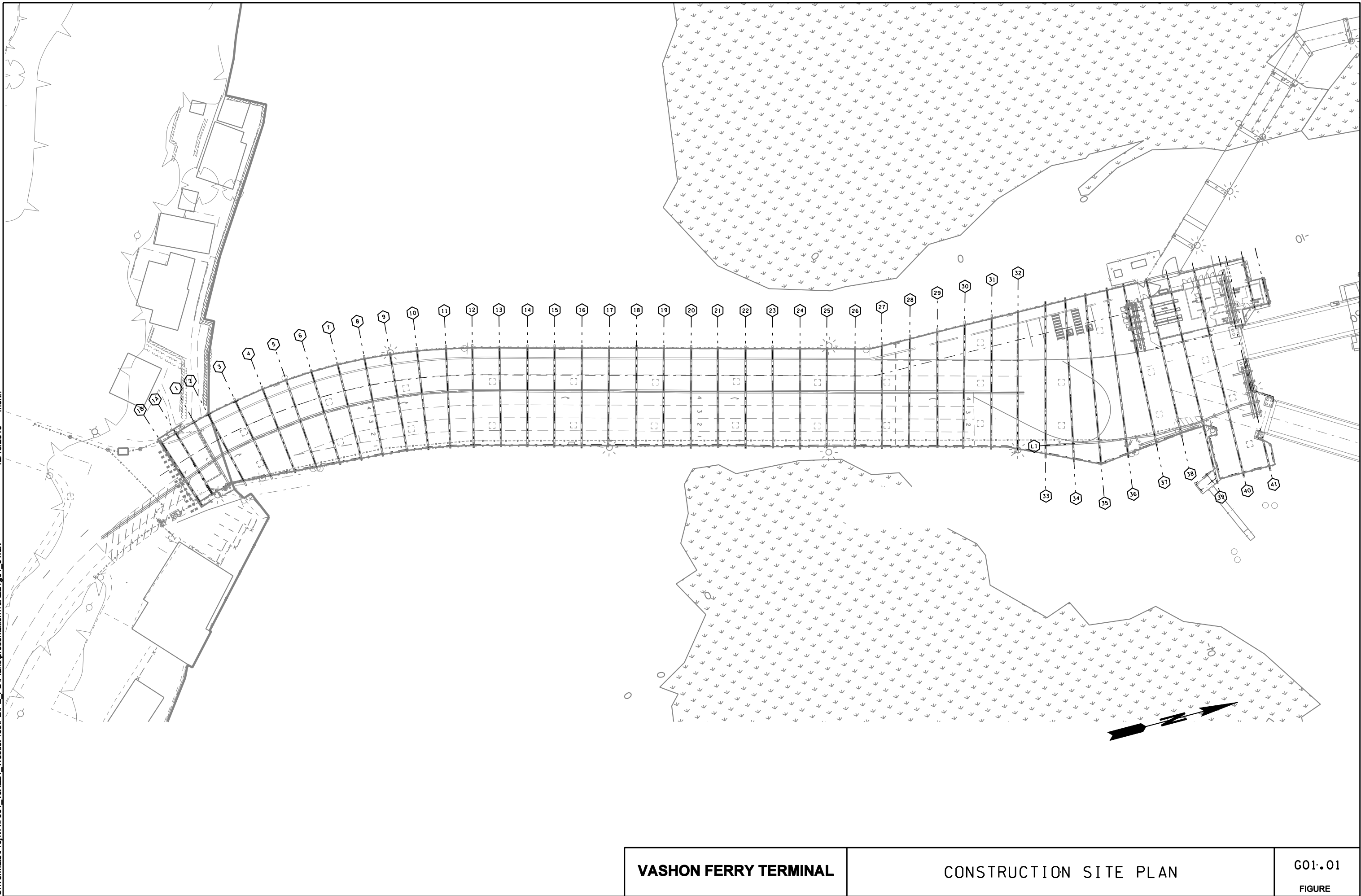
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WASHINGTON STATE FERRIES

VASHON FERRY TERMINAL TRESTLE REPLACEMENT

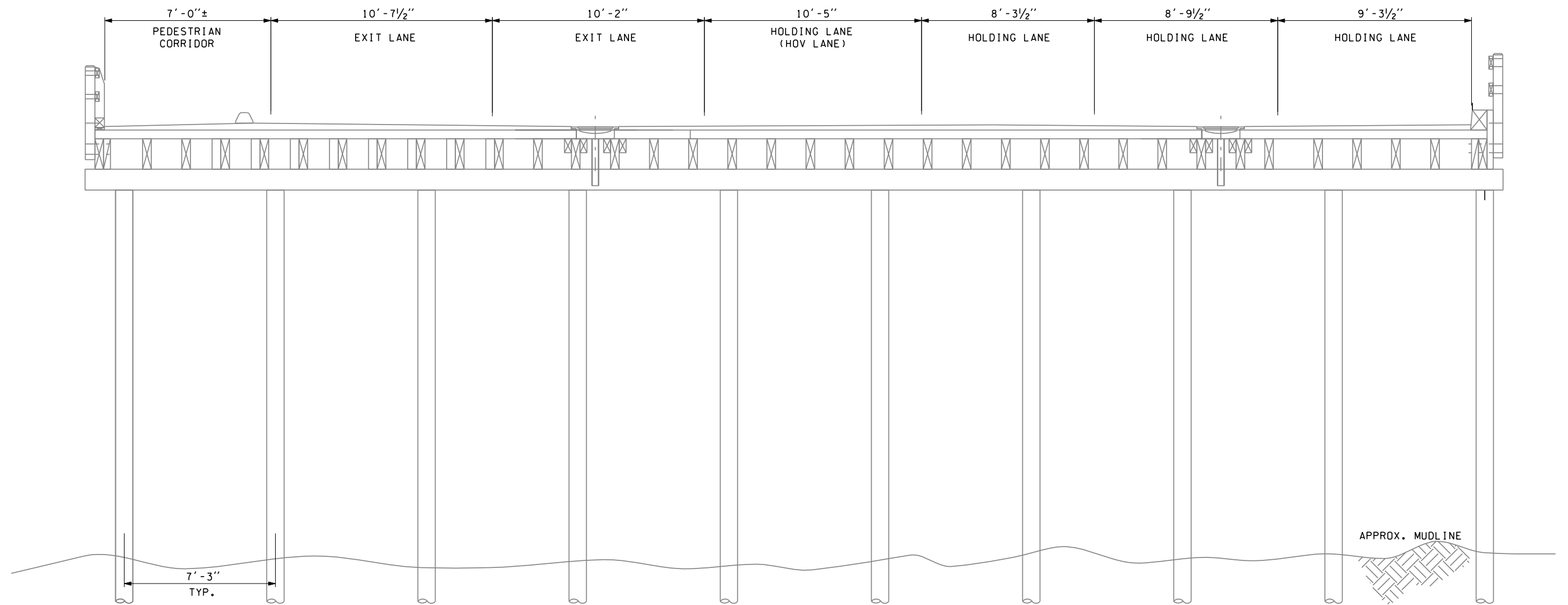
EXISTING CONDITIONS

FIGURE X



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| VASHON FERRY TERMINAL | CONSTRUCTION SITE PLAN | G01.01 |
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DECEMBER 13, 2010

VASHON FERRY TERMINAL

EXISTING TRESTLE CROSS SECTION (TYPICAL)

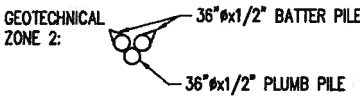
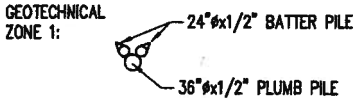
FIGURE

ALTERNATIVE 2B - REHABILITATION

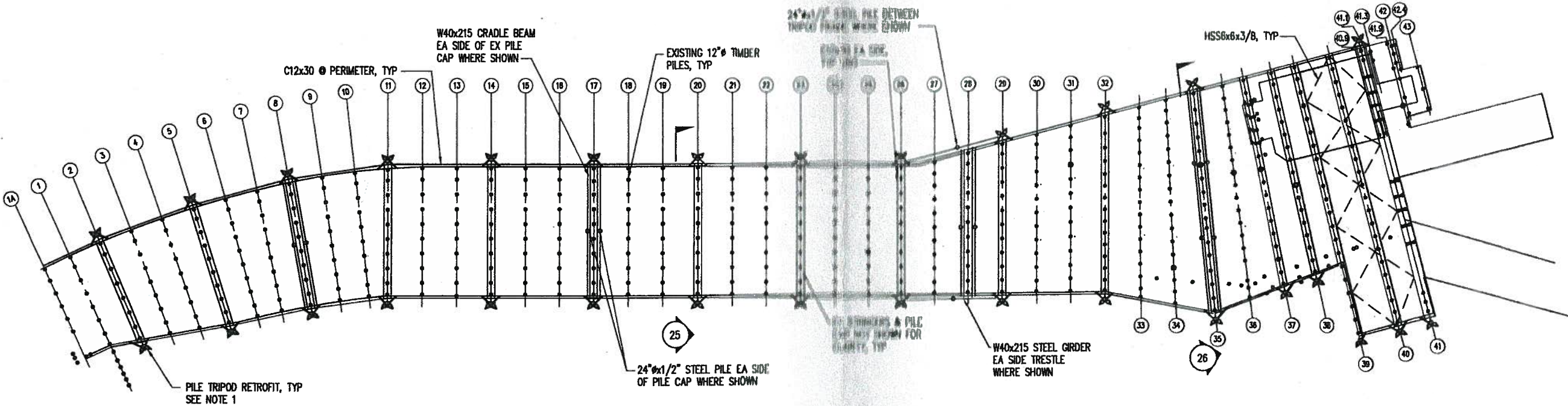
GENERAL NOTES:

1. INDICATES TYPICAL PILE TRIPOD RETROFIT.

2. TYPICAL BATTER PILE TRIOD ASSEMBLIES:



3. ALL PILES SHALL BE EMBEDDED 25' MINIMUM.



1 VASHON TERMINAL RETROFIT PLAN

kpf

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VASHON FERRY
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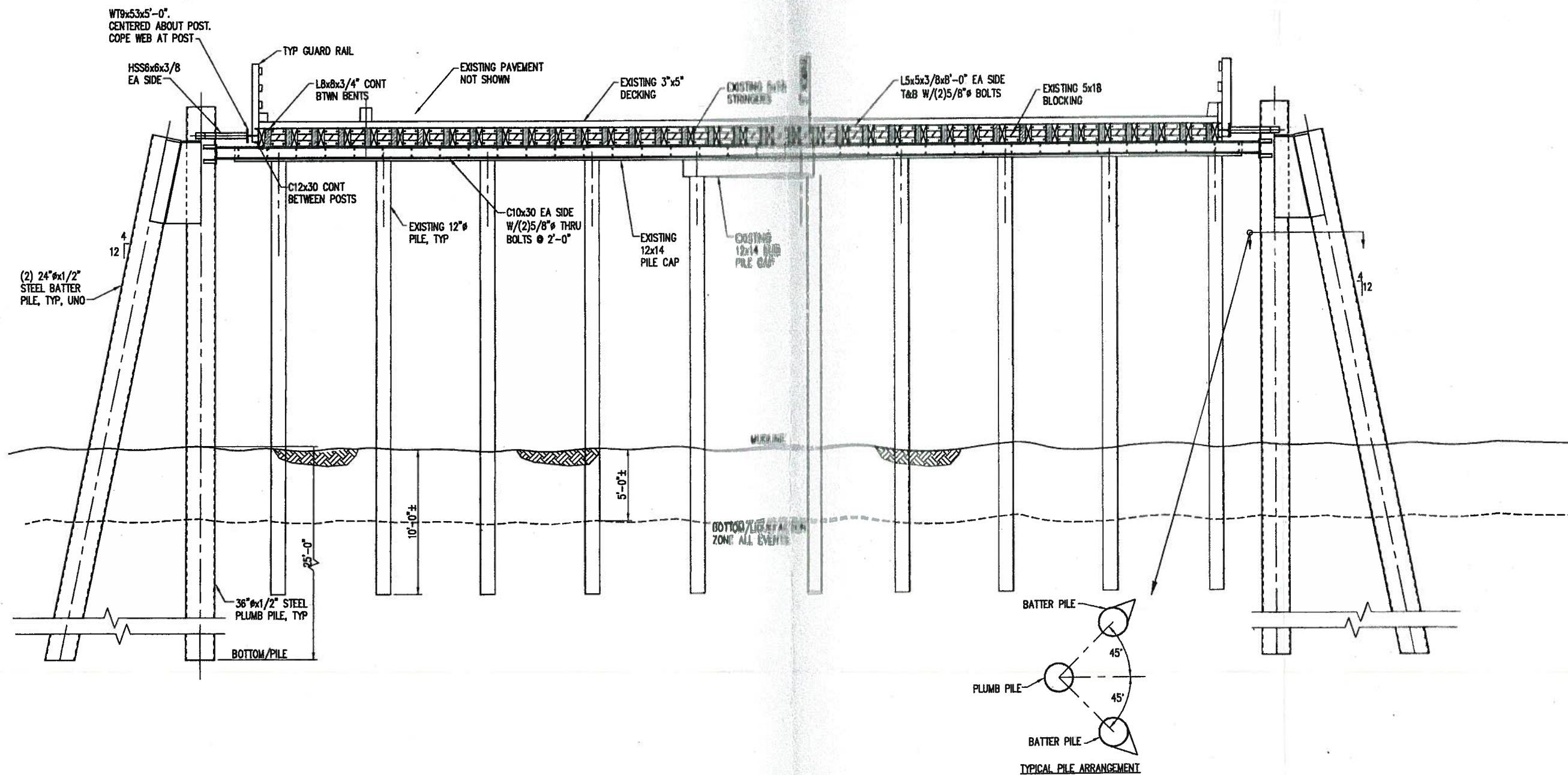
RETROFIT
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| SCALE: | NTS |
| DATE: | 4/2/12 |
| SHEET NO. | |

FIGURE 24

ALTERNATIVE 2B - REHABILITATION

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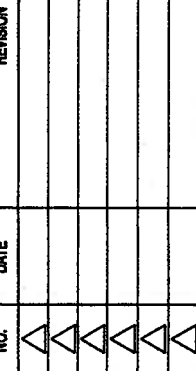
1 **VASHON TERMINAL RETROFIT
SECTION**

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VASHON FERRY TERMINAL

PROJECT NO.: 112024

SCALE: NTS

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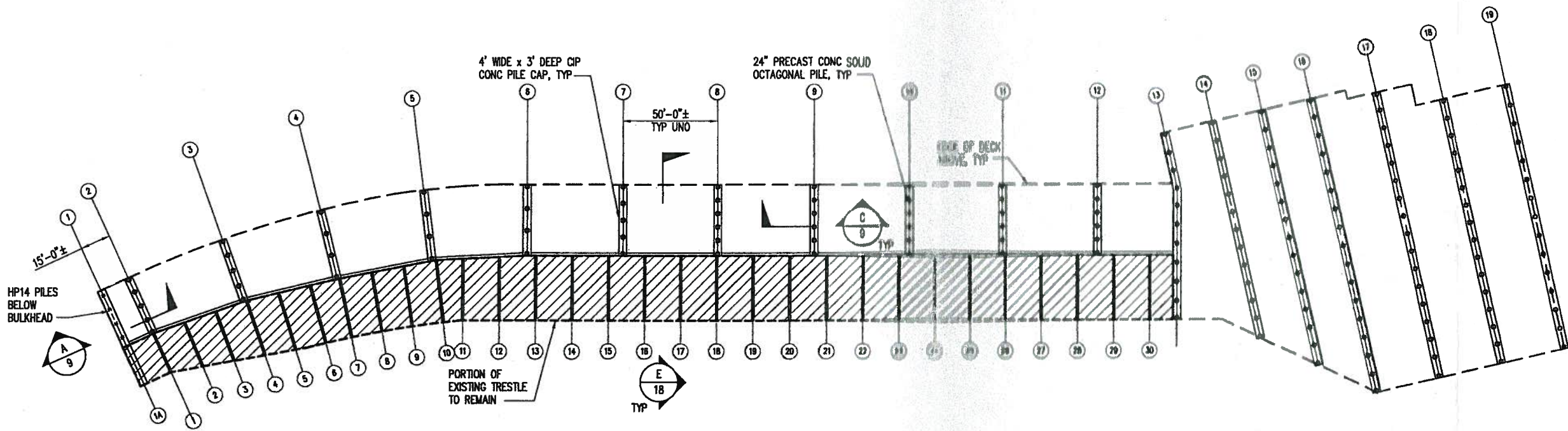
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FIGURE

26

1 VASHON TERMINAL RETROFIT SECTION

ALTERNATIVE 3 - PARTIAL REPLACEMENT



VASHON TRESTLE PILE & PILECAP PLAN
PRELIMINARY CONCEPT FOR PARTIAL REPLACEMENT

TO BE USED FOR BUDGET LEVEL COST ESTIMATING ONLY

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VASHON FERRY TERMINAL
PRELIMINARY CONCEPT
FOR PARTIAL REPLACEMENT

PILE/PILECAP PLAN

PROJECT NO.: 112024

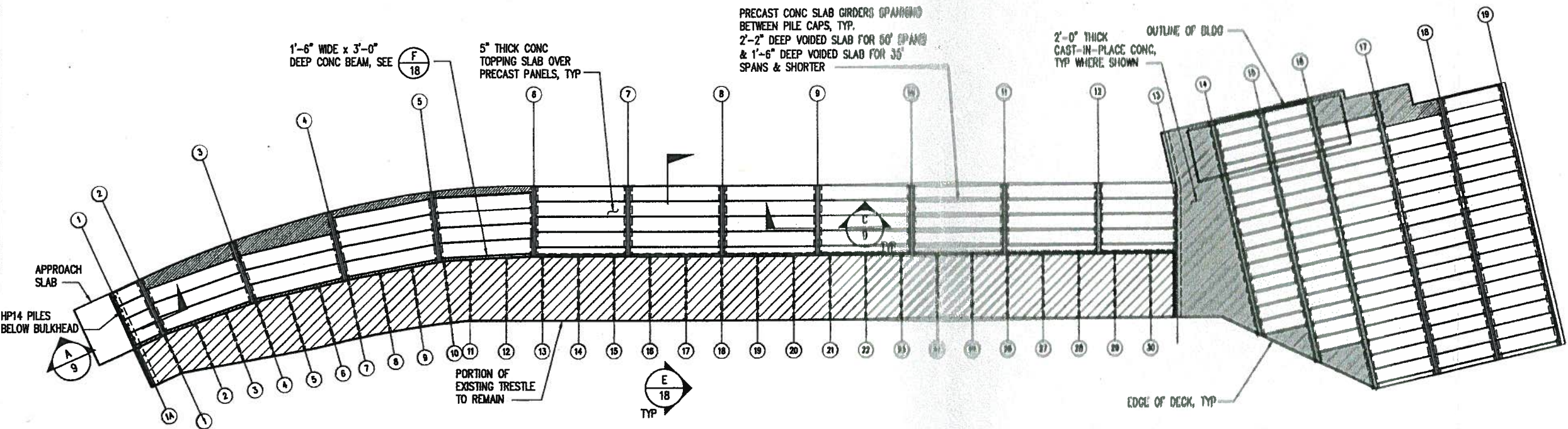
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FIGURE
16

ALTERNATIVE 3 - PARTIAL REPLACEMENT



VASHON TRESTLE DECK PLAN
PRELIMINARY CONCEPT FOR PARTIAL REPLACEMENT

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VASHON FERRY TERMINAL
PRELIMINARY CONCEPT
FOR PARTIAL REPLACEMENT

DECK PLAN

PROJECT NO.: 112024

SCALE: NTS

DATE: 3/16/12

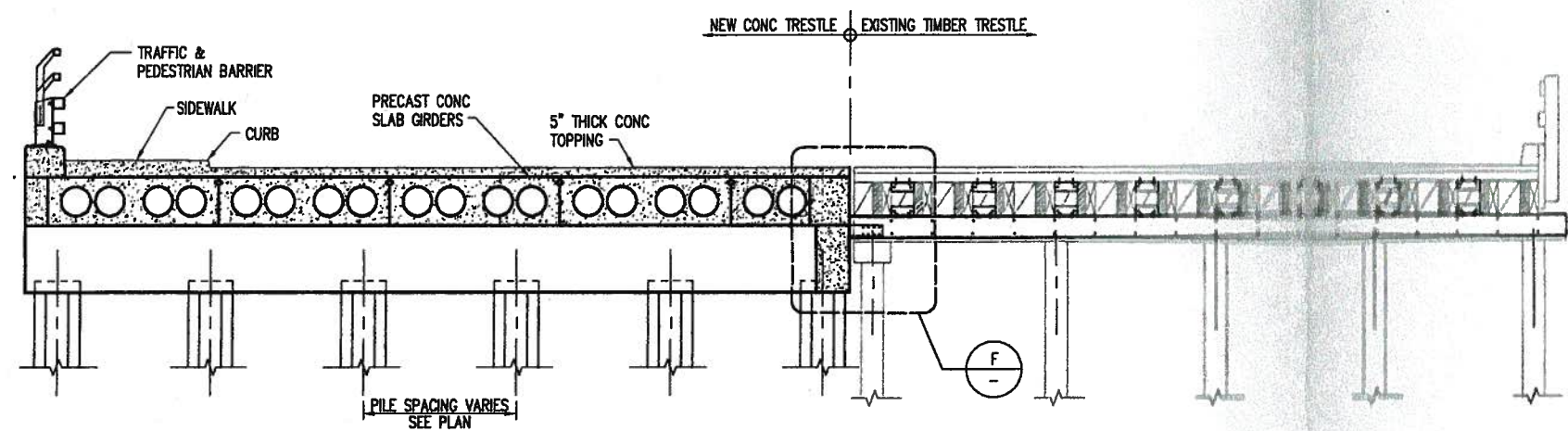
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FIGURE

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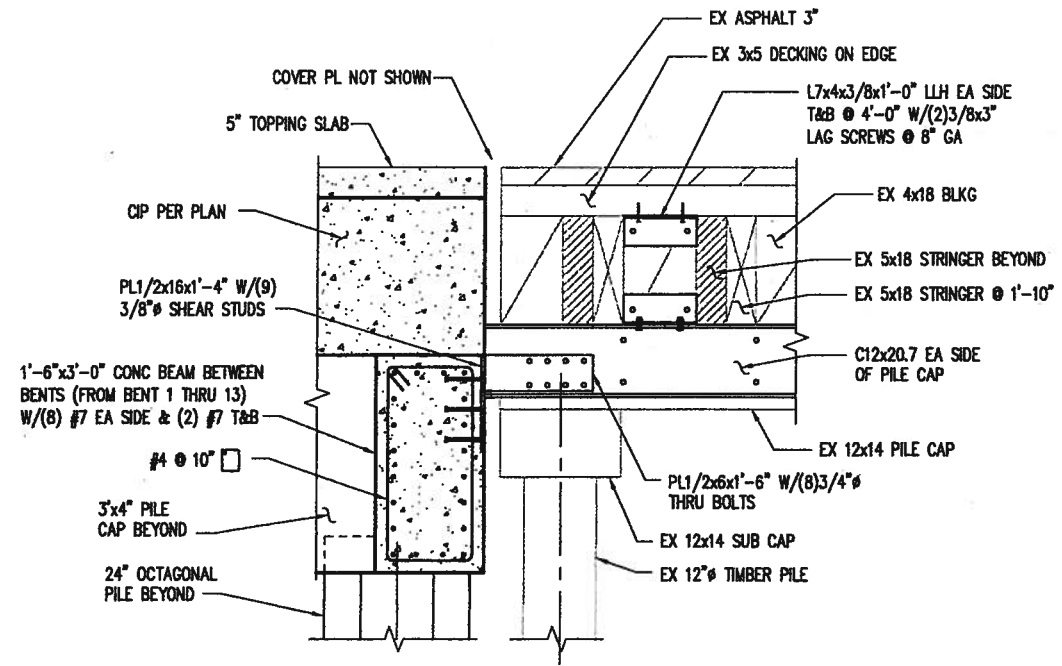
TO BE USED FOR BUDGET LEVEL COST ESTIMATING ONLY

ALTERNATIVE 3 - PARTIAL REPLACEMENT



TYPICAL TRANSVERSE SECTION
PARTIAL REPLACEMENT
SCALE: 1/4" = 1'-0"

E



DETAIL
SCALE: 3/4" = 1'-0"

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VASHON FERRY TERMINAL
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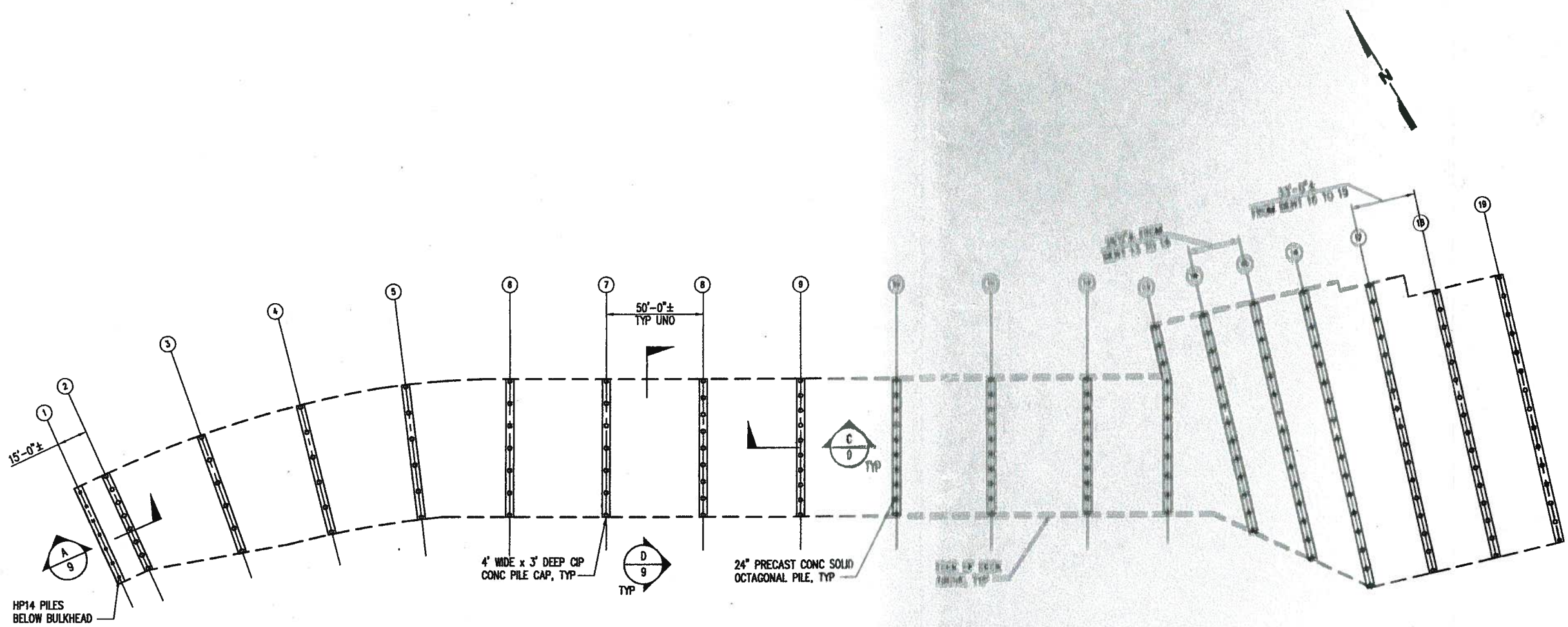
SECTIONS

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ALTERNATIVE 4 - FULL REPLACEMENT



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VASHON TRESTLE PILE & PILECAP PLAN
PRELIMINARY CONCEPT FOR COMPLETE REPLACEMENT

TO BE USED FOR BUDGET LEVEL COST ESTIMATING ONLY

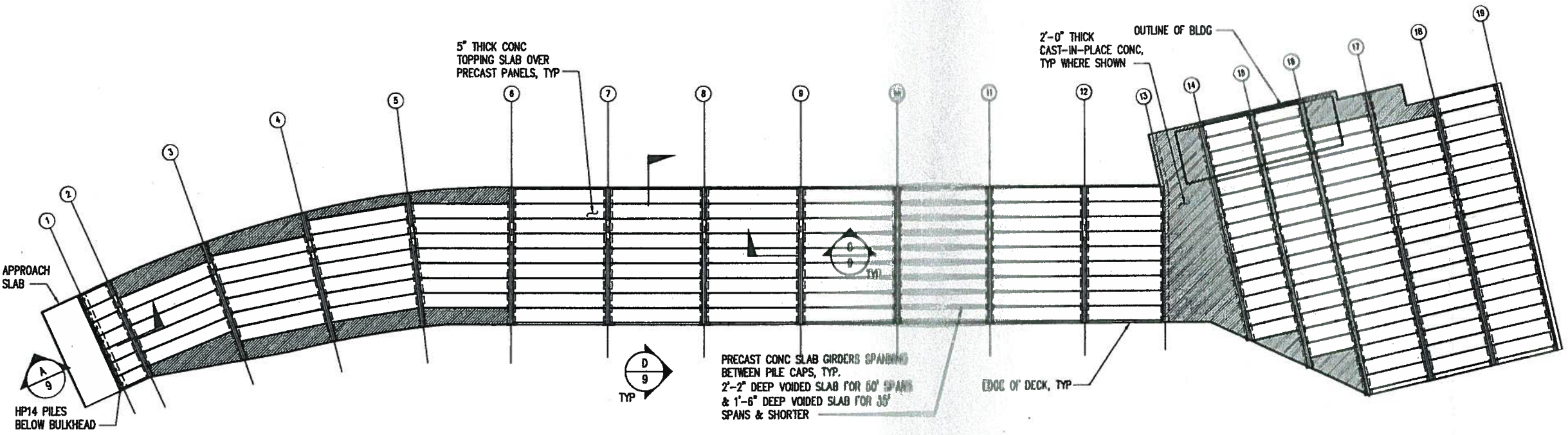
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VASHON FERRY TERMINAL
PRELIMINARY CONCEPT FOR REPLACEMENT
PILE/PILECAP PLAN

PROJECT NO.: 112024
SCALE: NTS
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FIGURE
6

ALTERNATIVE 4 - FULL REPLACEMENT



VASHON TRESTLE DECK PLAN
PRELIMINARY CONCEPT FOR COMPLETE REPLACEMENT

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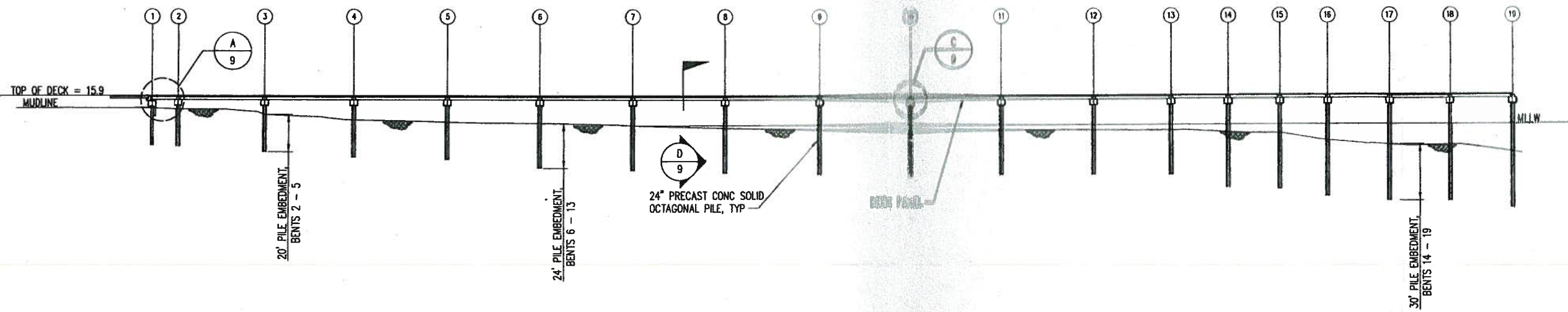
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VASHON FERRY TERMINAL
PRELIMINARY CONCEPT FOR REPLACEMENT
DECK PLAN

PROJECT NO.: 112024
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FIGURE
7

ALTERNATIVE 4 - FULL REPLACEMENT



VASHON TRESTLE SECTION
PRELIMINARY CONCEPT FOR COMPLETE REPLACEMENT

TO BE USED FOR BUDGET LEVEL COST ESTIMATING ONLY



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VASHON FERRY TERMINAL
PRELIMINARY CONCEPT FOR REPLACEMENT

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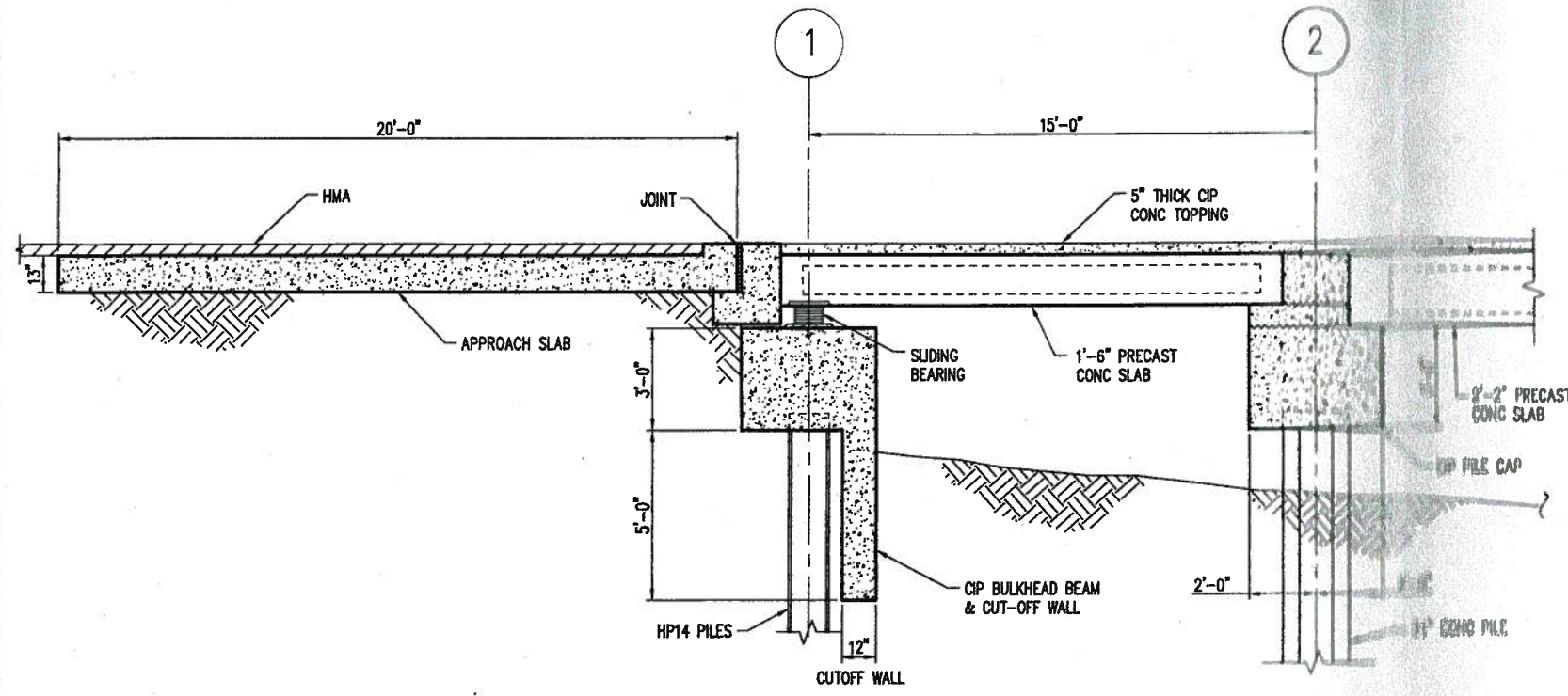
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FIGURE

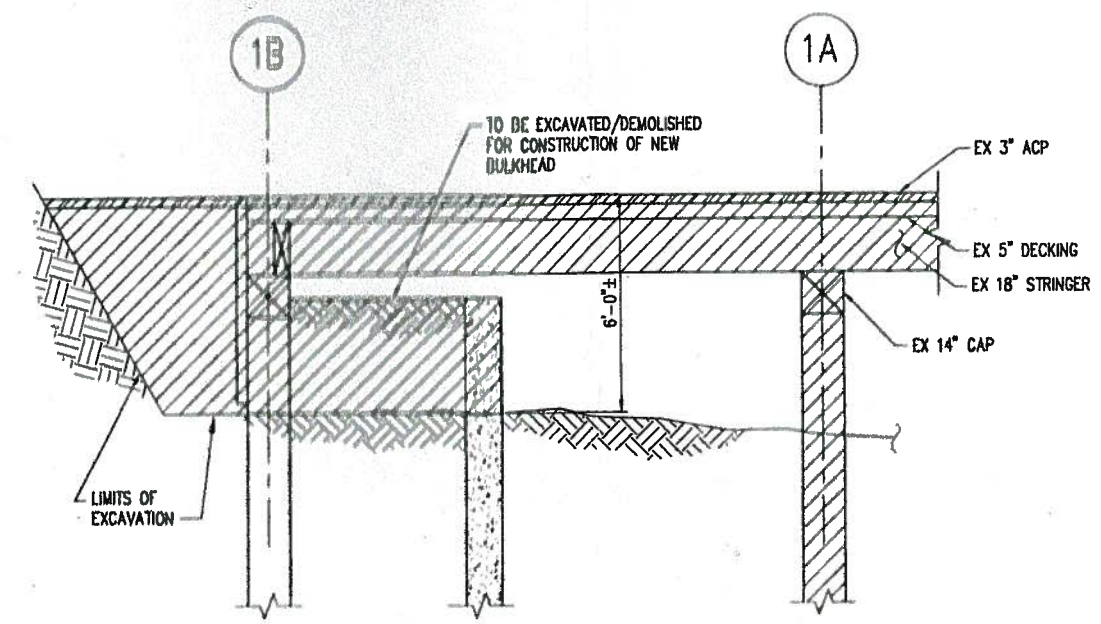
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ALTERNATIVE 4 - FULL REPLACEMENT



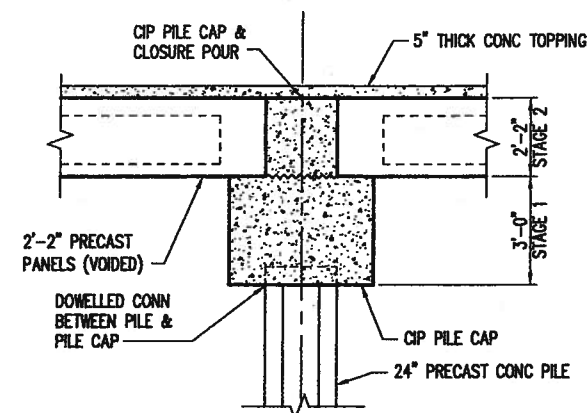
BULKHEAD SECTION
SCALE: 3/8"=1'-0"

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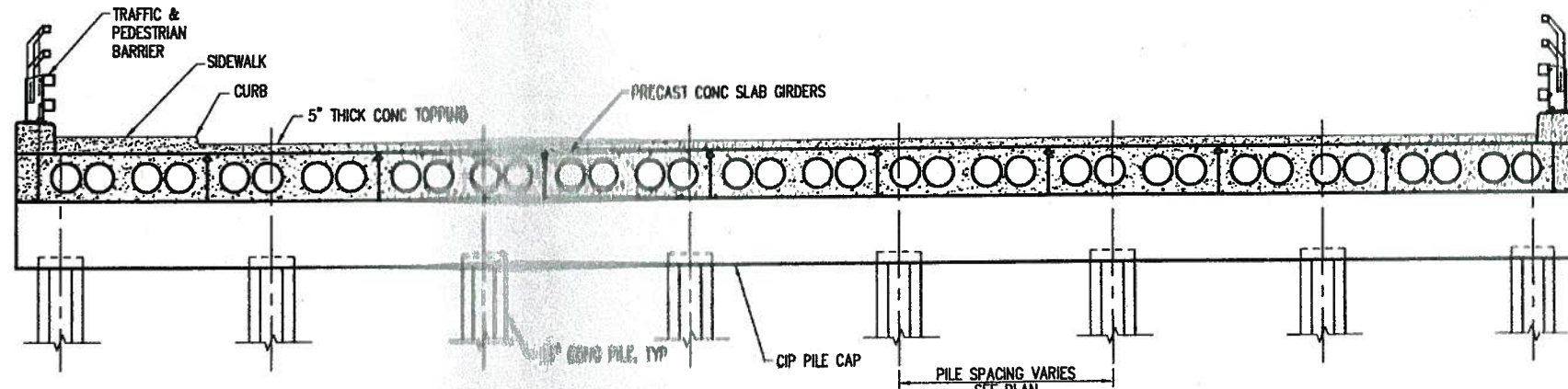
EXISTING BULKHEAD SECTION
SCALE: 3/8"=1'-0"

B



TYPICAL PILECAP SECTION
SCALE: 3/8"=1'-0"

C



TYPICAL TRANSVERSE SECTION
SCALE: 1/4"=1'-0"

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VASHON FERRY TERMINAL
PRELIMINARY CONCEPT FOR REPLACEMENT

SECTIONS

PROJECT NO.: 111075
SCALE: NTS
DATE: 3/16/12
SHEET NO.

FIGURE
9

APPENDIX C

Estimates

- 1. Alternative 2A Estimate**
- 2. Alternative 2B Estimate**
- 3. Alternative 3 Estimate**
- 4. Alternative 4 Estimate**

Alternative 2A

Project Title (WIN): Vashon Trestle Preservation
WIN: M05204A
SR: SR 160
Terminal: Vashon Island Ferry Terminal
Subprogram: Preservation (W1)
Level of Estimate: Scoping
Estimate Datum Date: May-2008
Revision Number: 1
Revision Date: June-12



| SUMMARY (Basis for Capital Cost Summary Table) w/ Markups | | | |
|--|----------|-------------|--------------|
| (1) Construction Base Cost (includes mobilization ^{2,3}) | | \$ | 4,697,431.75 |
| (2) Misc. Item Allowance ^{1,4} - Percentage Applied to No. (1) | 20.00% | \$ | 939,486.35 |
| (3) Contract Total - Sum of (1) & (2) | Subtotal | \$ | 5,636,918.10 |
| (4) Sales Tax - (Location Dependant) Percentage Applied to No. (3) | 8.6% | \$ | 484,774.96 |
| (5) Estimated Construction Contract Total - Sum of (3) & (4) | Subtotal | \$ | 6,121,693.06 |
| (6) Construction Engineering ² - Percentage Applied to No. (5), & Bid Items # 700-799 | 10.0% | \$ | 612,169.31 |
| (7) Construction (Change Order) Contingency ^{2,5} - Percentage Applied to No. (5) & Bid Items # 700-799 | 4.0% | \$ | 244,867.72 |
| (8) Other Construction (Below-the-line items) ^{5,7} | | | |
| BI # 700-799: Work by Others (Non-WSDOT) - Construction Engineering and Construction (Change Order) Contingencies Apply ⁷ | | | |
| A Agreements (External) | | \$ | - |
| B Work by Other State Forces (Non-WSDOT) | | \$ | - |
| C Other | | \$ | - |
| BI # 800-899: Work to be performed by or materials furnished by WSDOT - Construction Engineering and Construction (Change Order) Contingencies Do Not Apply ^{7,8} | | | |
| D Operations Construction Support | | \$ | 20,000.00 |
| E Other | | | |
| F Other | | | |
| (9) Construction Phase (CN) Total ⁷ - Sum of (5), (6), (7), & (8) | | \$ | 6,999,000 |
| (10) Design Engineering ^{1,5} - Percentage Applied to No. (5) for Planning & Scoping Level Estimates, Otherwise Use Actual from PMP | 12.0% | \$ | 734,603.17 |
| (11) Other Design Expenses | | | |
| G Operations Design Support | | \$ | 20,000.00 |
| H Other | | \$ | - |
| I Other | | \$ | - |
| (12) Preliminary Engineering (PE) Phase Total - Sum of (10) & (11) | | | \$755,000 |
| (13a) Pre-Design Study (part of Design Engineering above; rounded up to nearest \$1K) - If Applicable ⁶ | | | \$97,000 |
| (13b) OFM Level of Study ⁶ | | Full | |
| (13c) Project Level of Complexity ⁶ | | Complicated | |
| (14) Right Of Way (ROW) Phase Total | | | |
| (15) Total Project Cost - Sum of CN, PE, ROW | | \$ | 7,754,000 |
| Miscellaneous Item Allowance Includes: | | | |
| Environmental Mitigation, TESC, Operation Change Costs, Temporary Utility Connections and other work. | | | |
| Mark-ups for PE and CE assumed based on correlation of Project scope/type with WSDOT published guidance. This was done for each phase. | | | |
| Design Engineering Percentages (PE) determined utilizing M 3034.02 Table 3; Subprogram P2, Category PB | | | |
| Construction Engineering Percentages (CE) determined utilizing M22-31.01 Figure 800-2; Subprogram P2, Category PB | | | |

¹ Per Cost Estimating Manual for WSDOT Projects M 3034.02 (July 2009) (Table 2, low end of range unless justified.)

² Per Plans Preparation Manual M 22-31.01 (November 2008)

³ Per Chapter 12, Bridge Design Manual M 23-50.02 (May 2008)

⁴ See "Misc Item Allowance" Tab

⁵ Per Estimate Order of Calculations, Tax Rates, and 700 & 800 Items

⁶ <http://www.wsdot.wa.gov/publications/fulltext/CEVP/700%20800%20items.pdf>

⁷ See (Full Level) Predesign Study Tab for Projects over \$5M; Use 10% of PE for improvement projects under \$5M (Modified Level).

⁸ See EBASE User's Guide

⁹ 800-859 Level Items Apply to Federal Aide Projects; 860-899 Level Items Apply to Non-Federal Aide Projects

Alternative 2B

Project Title (WIN): Vashon Trestle Preservation
WIN: M05204A
SR: SR 160
Terminal: Vashon Island Ferry Terminal
Subprogram: Preservation (W1)
Level of Estimate: Scoping
Estimate Datum Date: May-2008
Revision Number: 1
Revision Date: June-12



| SUMMARY (Basis for Capital Cost Summary Table) w/ Markups | | | |
|--|----------|-------------|---------------|
| (1) Construction Base Cost (includes mobilization ^{2,3}) | | \$ | 10,864,480.00 |
| (2) Misc. Item Allowance ^{1,4} - Percentage Applied to No. (1) | 20.00% | \$ | 2,172,896.00 |
| (3) Contract Total - Sum of (1) & (2) | Subtotal | \$ | 13,037,376.00 |
| (4) Sales Tax - (Location Dependant) Percentage Applied to No. (3) | 8.6% | \$ | 1,121,214.34 |
| (5) Estimated Construction Contract Total - Sum of (3) & (4) | Subtotal | \$ | 14,158,590.34 |
| (6) Construction Engineering ² - Percentage Applied to No. (5), & Bid Items # 700-799 | 8.0% | \$ | 1,132,687.23 |
| (7) Construction (Change Order) Contingency ^{2,5} - Percentage Applied to No. (5) & Bid Items # 700-799 | 4.0% | \$ | 566,343.61 |
| (8) Other Construction (Below-the-line items) ^{5,7} | | | |
| BI # 700-799: Work by Others (Non-WSDOT) - Construction Engineering and Construction (Change Order) Contingencies Apply ⁷ | | | |
| A Agreements (External) | | \$ | - |
| B Work by Other State Forces (Non-WSDOT) | | \$ | - |
| C Other | | \$ | - |
| BI # 800-899: Work to be performed by or materials furnished by WSDOT - Construction Engineering and Construction (Change Order) Contingencies Do Not Apply ^{7,8} | | | |
| D Operations Construction Support | | \$ | 20,000.00 |
| E Other | | | |
| F Other | | | |
| (9) Construction Phase (CN) Total ⁷ - Sum of (5), (6), (7), & (8) | | \$ | 15,878,000 |
| (10) Design Engineering ^{1,5} - Percentage Applied to No. (5) for Planning & Scoping Level Estimates, Otherwise Use Actual from PMP | 11.0% | \$ | 1,557,444.94 |
| (11) Other Design Expenses | | | |
| G Operations Design Support | | \$ | 27,500.00 |
| H Other | | \$ | - |
| I Other | | \$ | - |
| (12) Preliminary Engineering (PE) Phase Total - Sum of (10) & (11) | | | \$1,585,000 |
| (13a) Pre-Design Study (part of Design Engineering above; rounded up to nearest \$1K) - If Applicable ⁶ | | | \$175,000 |
| (13b) OFM Level of Study ⁶ | | Full | |
| (13c) Project Level of Complexity ⁶ | | Complicated | |
| (14) Right Of Way (ROW) Phase Total | | | |
| (15) Total Project Cost - Sum of CN, PE, ROW | | \$ | 17,463,000 |
| Miscellaneous Item Allowance Includes: | | | |
| Environmental Mitigation, TESC, Operation Change Costs, Temporary Utility Connections and other work. | | | |
| Mark-ups for PE and CE assumed based on correlation of Project scope/type with WSDOT published guidance. | | | |
| Design Engineering Percentages (PE) determined utilizing M 3034.02 Table 3; Subprogram P2, Category PB | | | |
| Construction Engineering Percentages (CE) determined utilizing M22-31.01 Figure 800-2: Subprogram P2, Category PB | | | |

¹ Per Cost Estimating Manual for WSDOT Projects M 3034.02 (July 2009) (Table 2, low end of range unless justified.)

² Per Plans Preparation Manual M 22-31.01 (November 2008)

³ Per Chapter 12, Bridge Design Manual M 23-50.02 (May 2008)

⁴ See "Misc Item Allowance" Tab

⁵ Per Estimate Order of Calculations, Tax Rates, and 700 & 800 Items

<http://www.wsdot.wa.gov/publications/fulltext/CEVP/700%20800%20items.pdf>

⁶ See (Full Level) Predesign Study Tab for Projects over \$5M; Use 10% of PE for improvement projects under \$5M (Modified Level).

⁷ See EBASE User's Guide

⁸ 800-859 Level Items Apply to Federal Aide Projects; 860-899 Level Items Apply to Non-Federal Aide Projects

Alternative 2B

Project Title (WIN): Vashon Trestle Preservation
WIN: M05204A
SR: SR 160
Terminal: Vashon Island Ferry Terminal
Subprogram: Preservation (W1)
Level of Estimate: Scoping
Estimate Datum Date: May-2008
Revision Number: 1
Revision Date: June-12



| SUMMARY (Basis for Capital Cost Summary Table) w/ Markups | | | |
|--|----------|-------------|--------------|
| (1) Construction Base Cost (includes mobilization ^{2,3}) | | \$ | 4,599,267.20 |
| (2) Misc. Item Allowance ^{1,4} - Percentage Applied to No. (1) | 20.00% | \$ | 919,853.44 |
| (3) Contract Total - Sum of (1) & (2) | Subtotal | \$ | 5,519,120.64 |
| (4) Sales Tax - (Location Dependant) Percentage Applied to No. (3) | 8.6% | \$ | 474,644.38 |
| (5) Estimated Construction Contract Total - Sum of (3) & (4) | Subtotal | \$ | 5,993,765.02 |
| (6) Construction Engineering ² - Percentage Applied to No. (5), & Bid Items # 700-799 | 10.0% | \$ | 599,376.50 |
| (7) Construction (Change Order) Contingency ^{2,5} - Percentage Applied to No. (5) & Bid Items # 700-799 | 4.0% | \$ | 239,750.60 |
| (8) Other Construction (Below-the-line items) ^{5,7} | | | |
| BI # 700-799: Work by Others (Non-WSDOT) - Construction Engineering and Construction (Change Order) Contingencies Apply ⁷ | | | |
| A Agreements (External) | | \$ | - |
| B Work by Other State Forces (Non-WSDOT) | | \$ | - |
| C Other | | \$ | - |
| BI # 800-899: Work to be performed by or materials furnished by WSDOT - Construction Engineering and Construction (Change Order) Contingencies Do Not Apply ^{7,8} | | | |
| D Operations Construction Support | | \$ | 20,000.00 |
| E Other | | \$ | - |
| F Other | | \$ | - |
| (9) Construction Phase (CN) Total ⁷ - Sum of (5), (6), (7), & (8) | | \$ | 6,853,000 |
| (10) Design Engineering ^{1,5} - Percentage Applied to No. (5) for Planning & Scoping Level Estimates, Otherwise Use Actual from PMP | 12.0% | \$ | 719,251.80 |
| (11) Other Design Expenses | | | |
| G Operations Design Support | | \$ | 27,500.00 |
| H Other | | \$ | - |
| I Other | | \$ | - |
| (12) Preliminary Engineering (PE) Phase Total - Sum of (10) & (11) | | | \$747,000 |
| (13a) Pre-Design Study (part of Design Engineering above; rounded up to nearest \$1K) - If Applicable ⁶ | | | \$95,000 |
| (13b) OFM Level of Study ⁶ | | Full | |
| (13c) Project Level of Complexity ⁶ | | Complicated | |
| (14) Right Of Way (ROW) Phase Total | | | |
| (15) Total Project Cost - Sum of CN, PE, ROW | | \$ | 7,600,000 |
| Miscellaneous Item Allowance Includes: | | | |
| Environmental Mitigation, TESC, Operation Change Costs, Temporary Utility Connections and other work. | | | |
| Mark-ups for PE and CE assumed based on correlation of Project scope/type with WSDOT published guidance. | | | |
| Design Engineering Percentages (PE) determined utilizing M 3034.02 Table 3; Subprogram P2, Category PB | | | |
| Construction Engineering Percentages (CE) determined utilizing M22-31.01 Figure 800-2: Subprogram P2, Category PB | | | |

¹ Per Cost Estimating Manual for WSDOT Projects M 3034.02 (July 2009) (Table 2, low end of range unless justified.)

² Per Plans Preparation Manual M 22-31.01 (November 2008)

³ Per Chapter 12, Bridge Design Manual M 23-50.02 (May 2008)

⁴ See "Misc Item Allowance" Tab

⁵ Per Estimate Order of Calculations, Tax Rates, and 700 & 800 Items

<http://www.wsdot.wa.gov/publications/fulltext/CEVP/700%20800%20items.pdf>

⁶ See (Full Level) Predesign Study Tab for Projects over \$5M; Use 10% of PE for improvement projects under \$5M (Modified Level).

⁷ See EBASE User's Guide

⁸ 800-859 Level Items Apply to Federal Aide Projects; 860-899 Level Items Apply to Non-Federal Aide Projects

Alternative 2B

Project Title (WIN): Vashon Trestle Preservation
WIN: M05204A
SR: SR 160
Terminal: Vashon Island Ferry Terminal
Subprogram: Preservation (W1)
Level of Estimate: Scoping
Estimate Datum Date: May-2008
Revision Number: 1
Revision Date: June-12



| SUMMARY (Basis for Capital Cost Summary Table) w/ Markups | | | |
|--|----------|-------------|--------------|
| (1) Construction Base Cost (includes mobilization ^{2,3}) | | \$ | 3,539,910.00 |
| (2) Misc. Item Allowance ^{1,4} - Percentage Applied to No. (1) | 20.00% | \$ | 707,982.00 |
| (3) Contract Total - Sum of (1) & (2) | Subtotal | \$ | 4,247,892.00 |
| (4) Sales Tax - (Location Dependant) Percentage Applied to No. (3) | 8.6% | \$ | 365,318.71 |
| (5) Estimated Construction Contract Total - Sum of (3) & (4) | Subtotal | \$ | 4,613,210.71 |
| (6) Construction Engineering ² - Percentage Applied to No. (5), & Bid Items # 700-799 | 10.0% | \$ | 461,321.07 |
| (7) Construction (Change Order) Contingency ^{2,5} - Percentage Applied to No. (5) & Bid Items # 700-799 | 4.0% | \$ | 184,528.43 |
| (8) Other Construction (Below-the-line items) ^{5,7} | | | |
| BI # 700-799: Work by Others (Non-WSDOT) - Construction Engineering and Construction (Change Order) Contingencies Apply ⁷ | | | |
| A Agreements (External) | | \$ | - |
| B Work by Other State Forces (Non-WSDOT) | | \$ | - |
| C Other | | \$ | - |
| BI # 800-899: Work to be performed by or materials furnished by WSDOT - Construction Engineering and Construction (Change Order) Contingencies Do Not Apply ^{7,8} | | | |
| D Operations Construction Support | | \$ | 20,000.00 |
| E Other | | | |
| F Other | | | |
| (9) Construction Phase (CN) Total ⁷ - Sum of (5), (6), (7), & (8) | | \$ | 5,279,000 |
| (10) Design Engineering ^{1,5} - Percentage Applied to No. (5) for Planning & Scoping Level Estimates, Otherwise Use Actual from PMP | 12.0% | \$ | 553,585.29 |
| (11) Other Design Expenses | | | |
| G Operations Design Support | | \$ | 27,500.00 |
| H Other | | \$ | - |
| I Other | | \$ | - |
| (12) Preliminary Engineering (PE) Phase Total - Sum of (10) & (11) | | | \$581,000 |
| (13a) Pre-Design Study (part of Design Engineering above; rounded up to nearest \$1K) - If Applicable ⁶ | | | \$74,000 |
| (13b) OFM Level of Study ⁶ | | Full | |
| (13c) Project Level of Complexity ⁶ | | Complicated | |
| (14) Right Of Way (ROW) Phase Total | | | |
| (15) Total Project Cost - Sum of CN, PE, ROW | | \$ | 5,860,000 |
| Miscellaneous Item Allowance Includes: | | | |
| Environmental Mitigation, TESC, Operation Change Costs, Temporary Utility Connections and other work. | | | |
| Mark-ups for PE and CE assumed based on correlation of Project scope/type with WSDOT published guidance. | | | |
| Design Engineering Percentages (PE) determined utilizing M 3034.02 Table 3; Subprogram P2, Category PB | | | |
| Construction Engineering Percentages (CE) determined utilizing M22-31.01 Figure 800-2: Subprogram P2, Category PB | | | |

¹ Per Cost Estimating Manual for WSDOT Projects M 3034.02 (July 2009) (Table 2, low end of range unless justified.)

² Per Plans Preparation Manual M 22-31.01 (November 2008)

³ Per Chapter 12, Bridge Design Manual M 23-50.02 (May 2008)

⁴ See "Misc Item Allowance" Tab

⁵ Per Estimate Order of Calculations, Tax Rates, and 700 & 800 Items

<http://www.wsdot.wa.gov/publications/fulltext/CEVP/700%20800%20items.pdf>

⁶ See (Full Level) Predesign Study Tab for Projects over \$5M; Use 10% of PE for improvement projects under \$5M (Modified Level).

⁷ See EBASE User's Guide

⁸ 800-859 Level Items Apply to Federal Aide Projects; 860-899 Level Items Apply to Non-Federal Aide Projects

Alternative 2B

Project Title (WIN): Vashon Trestle Preservation
WIN: M05204A
SR: SR 160
Terminal: Vashon Island Ferry Terminal
Subprogram: Preservation (W1)
Level of Estimate: Scoping
Estimate Datum Date: May-2008
Revision Number: 1
Revision Date: June-12



| SUMMARY (Basis for Capital Cost Summary Table) w/ Markups | | | |
|--|----------|-------------|--------------|
| (1) Construction Base Cost (includes mobilization ^{2,3}) | | \$ | 4,694,910.00 |
| (2) Misc. Item Allowance ^{1,4} - Percentage Applied to No. (1) | 20.00% | \$ | 938,982.00 |
| (3) Contract Total - Sum of (1) & (2) | Subtotal | \$ | 5,633,892.00 |
| (4) Sales Tax - (Location Dependant) Percentage Applied to No. (3) | 8.6% | \$ | 484,514.71 |
| (5) Estimated Construction Contract Total - Sum of (3) & (4) | Subtotal | \$ | 6,118,406.71 |
| (6) Construction Engineering ² - Percentage Applied to No. (5), & Bid Items # 700-799 | 10.0% | \$ | 611,840.67 |
| (7) Construction (Change Order) Contingency ^{2,5} - Percentage Applied to No. (5) & Bid Items # 700-799 | 4.0% | \$ | 244,736.27 |
| (8) Other Construction (Below-the-line items) ^{5,7} | | | |
| BI # 700-799: Work by Others (Non-WSDOT) - Construction Engineering and Construction (Change Order) Contingencies Apply ⁷ | | | |
| A Agreements (External) | | \$ | - |
| B Work by Other State Forces (Non-WSDOT) | | \$ | - |
| C Other | | \$ | - |
| BI # 800-899: Work to be performed by or materials furnished by WSDOT - Construction Engineering and Construction (Change Order) Contingencies Do Not Apply ^{7,8} | | | |
| D Operations Construction Support | | \$ | 20,000.00 |
| E Other | | | |
| F Other | | | |
| (9) Construction Phase (CN) Total ⁷ - Sum of (5), (6), (7), & (8) | | \$ | 6,995,000 |
| (10) Design Engineering ^{1,5} - Percentage Applied to No. (5) for Planning & Scoping Level Estimates, Otherwise Use Actual from PMP | 12.0% | \$ | 734,208.81 |
| (11) Other Design Expenses | | | |
| G Operations Design Support | | \$ | 27,500.00 |
| H Other | | \$ | - |
| I Other | | \$ | - |
| (12) Preliminary Engineering (PE) Phase Total - Sum of (10) & (11) | | | \$762,000 |
| (13a) Pre-Design Study (part of Design Engineering above; rounded up to nearest \$1K) - If Applicable ⁶ | | | \$97,000 |
| (13b) OFM Level of Study ⁶ | | Full | |
| (13c) Project Level of Complexity ⁶ | | Complicated | |
| (14) Right Of Way (ROW) Phase Total | | | |
| (15) Total Project Cost - Sum of CN, PE, ROW | | \$ | 7,757,000 |
| Miscellaneous Item Allowance Includes: | | | |
| Environmental Mitigation, TESC, Operation Change Costs, Temporary Utility Connections and other work. | | | |
| Mark-ups for PE and CE assumed based on correlation of Project scope/type with WSDOT published guidance. | | | |
| Design Engineering Percentages (PE) determined utilizing M 3034.02 Table 3; Subprogram P2, Category PB | | | |
| Construction Engineering Percentages (CE) determined utilizing M22-31.01 Figure 800-2: Subprogram P2, Category PB | | | |

¹ Per Cost Estimating Manual for WSDOT Projects M 3034.02 (July 2009) (Table 2, low end of range unless justified.)

² Per Plans Preparation Manual M 22-31.01 (November 2008)

³ Per Chapter 12, Bridge Design Manual M 23-50.02 (May 2008)

⁴ See "Misc Item Allowance" Tab

⁵ Per Estimate Order of Calculations, Tax Rates, and 700 & 800 Items

<http://www.wsdot.wa.gov/publications/fulltext/CEVP/700%20800%20items.pdf>

⁶ See (Full Level) Predesign Study Tab for Projects over \$5M; Use 10% of PE for improvement projects under \$5M (Modified Level).

⁷ See EBASE User's Guide

⁸ 800-859 Level Items Apply to Federal Aide Projects; 860-899 Level Items Apply to Non-Federal Aide Projects

Alternative 2B

Project Title (WIN): Vashon Trestle Preservation
WIN: M05204A
SR: SR 160
Terminal: Vashon Island Ferry Terminal
Subprogram: Preservation (W1)
Level of Estimate: Scoping
Estimate Datum Date: May-2008
Revision Number: 1
Revision Date: June-12



| SUMMARY (Basis for Capital Cost Summary Table) w/ Markups | | | |
|--|----------|-------------|--------------|
| (1) Construction Base Cost (includes mobilization ^{2,3}) | | \$ | 3,539,910.00 |
| (2) Misc. Item Allowance ^{1,4} - Percentage Applied to No. (1) | 20.00% | \$ | 707,982.00 |
| (3) Contract Total - Sum of (1) & (2) | Subtotal | \$ | 4,247,892.00 |
| (4) Sales Tax - (Location Dependant) Percentage Applied to No. (3) | 8.6% | \$ | 365,318.71 |
| (5) Estimated Construction Contract Total - Sum of (3) & (4) | Subtotal | \$ | 4,613,210.71 |
| (6) Construction Engineering ² - Percentage Applied to No. (5), & Bid Items # 700-799 | 10.0% | \$ | 461,321.07 |
| (7) Construction (Change Order) Contingency ^{2,5} - Percentage Applied to No. (5) & Bid Items # 700-799 | 4.0% | \$ | 184,528.43 |
| (8) Other Construction (Below-the-line items) ^{5,7} | | | |
| BI # 700-799: Work by Others (Non-WSDOT) - Construction Engineering and Construction (Change Order) Contingencies Apply ⁷ | | | |
| A Agreements (External) | | \$ | - |
| B Work by Other State Forces (Non-WSDOT) | | \$ | - |
| C Other | | \$ | - |
| BI # 800-899: Work to be performed by or materials furnished by WSDOT - Construction Engineering and Construction (Change Order) Contingencies Do Not Apply ^{7,8} | | | |
| D Operations Construction Support | | \$ | 20,000.00 |
| E Other | | | |
| F Other | | | |
| (9) Construction Phase (CN) Total ⁷ - Sum of (5), (6), (7), & (8) | | \$ | 5,279,000 |
| (10) Design Engineering ^{1,5} - Percentage Applied to No. (5) for Planning & Scoping Level Estimates, Otherwise Use Actual from PMP | 12.0% | \$ | 553,585.29 |
| (11) Other Design Expenses | | | |
| G Operations Design Support | | \$ | 27,500.00 |
| H Other | | \$ | - |
| I Other | | \$ | - |
| (12) Preliminary Engineering (PE) Phase Total - Sum of (10) & (11) | | | \$581,000 |
| (13a) Pre-Design Study (part of Design Engineering above; rounded up to nearest \$1K) - If Applicable ⁶ | | | \$74,000 |
| (13b) OFM Level of Study ⁶ | | Full | |
| (13c) Project Level of Complexity ⁶ | | Complicated | |
| (14) Right Of Way (ROW) Phase Total | | | |
| (15) Total Project Cost - Sum of CN, PE, ROW | | \$ | 5,860,000 |
| Miscellaneous Item Allowance Includes: | | | |
| Environmental Mitigation, TESC, Operation Change Costs, Temporary Utility Connections and other work. | | | |
| Mark-ups for PE and CE assumed based on correlation of Project scope/type with WSDOT published guidance. | | | |
| Design Engineering Percentages (PE) determined utilizing M 3034.02 Table 3; Subprogram P2, Category PB | | | |
| Construction Engineering Percentages (CE) determined utilizing M22-31.01 Figure 800-2: Subprogram P2, Category PB | | | |

¹ Per Cost Estimating Manual for WSDOT Projects M 3034.02 (July 2009) (Table 2, low end of range unless justified.)

² Per Plans Preparation Manual M 22-31.01 (November 2008)

³ Per Chapter 12, Bridge Design Manual M 23-50.02 (May 2008)

⁴ See "Misc Item Allowance" Tab

⁵ Per Estimate Order of Calculations, Tax Rates, and 700 & 800 Items

<http://www.wsdot.wa.gov/publications/fulltext/CEVP/700%20800%20items.pdf>

⁶ See (Full Level) Predesign Study Tab for Projects over \$5M; Use 10% of PE for improvement projects under \$5M (Modified Level).

⁷ See EBASE User's Guide

⁸ 800-859 Level Items Apply to Federal Aide Projects; 860-899 Level Items Apply to Non-Federal Aide Projects

Alternative 3

Project Title (WIN): Vashon Trestle Preservation
WIN: M05204A
SR: SR 160
Terminal: Vashon Island Ferry Terminal
Subprogram: Preservation (W1)
Level of Estimate: Scoping
Estimate Datum Date: May-2008
Revision Number: 4
Revision Date: June-12



| SUMMARY (Basis for Capital Cost Summary Table) w/ Markups | | | |
|--|----------|-------------|---------------|
| (1) Construction Base Cost (includes mobilization ^{2,3}) | | \$ | 19,660,736.70 |
| (2) Misc. Item Allowance ^{1,4} - Percentage Applied to No. (1) | 20.00% | \$ | 3,932,147.34 |
| (3) Contract Total - Sum of (1) & (2) | Subtotal | \$ | 23,592,884.04 |
| (4) Sales Tax - (Location Dependant) Percentage Applied to No. (3) | 8.6% | \$ | 2,028,988.03 |
| (5) Estimated Construction Contract Total - Sum of (3) & (4) | Subtotal | \$ | 25,621,872.07 |
| (6) Construction Engineering ² - Percentage Applied to No. (5), & Bid Items # 700-799 | 8.0% | \$ | 2,049,749.77 |
| (7) Construction (Change Order) Contingency ^{2,5} - Percentage Applied to No. (5) & Bid Items # 700-799 | 4.0% | \$ | 1,024,874.88 |
| (8) Other Construction (Below-the-line items) ^{5,7} | | | |
| BI # 700-799: Work by Others (Non-WSDOT) - Construction Engineering and Construction (Change Order) Contingencies Apply ⁷ | | | |
| A Agreements (External) | | \$ | - |
| B Work by Other State Forces (Non-WSDOT) | | \$ | - |
| C Other | | \$ | - |
| BI # 800-899: Work to be performed by or materials furnished by WSDOT - Construction Engineering and Construction (Change Order) Contingencies Do Not Apply ^{7,8} | | | |
| D Temp. Buildings | | \$ | 252,000.00 |
| E Operations Construction Support | | \$ | 20,000.00 |
| F | | | |
| (9) Construction Phase (CN) Total ⁷ - Sum of (5), (6), (7), & (8) | | \$ | 28,968,000 |
| (10) Design Engineering ^{1,5} - Percentage Applied to No. (5) for Planning & Scoping Level Estimates, Otherwise Use Actual from PMP | 11.0% | \$ | 2,818,405.93 |
| (11) Other Design Expenses | | | |
| G Operations Design Support | | \$ | 27,500.00 |
| H Other | | \$ | - |
| I Other | | \$ | - |
| (12) Preliminary Engineering (PE) Phase Total - Sum of (10) & (11) | | | \$2,846,000 |
| (13a) Pre-Design Study (part of Design Engineering above; rounded up to nearest \$1K) - If Applicable ⁶ | | | \$223,000 |
| (13b) OFM Level of Study ⁶ | | Full | |
| (13c) Project Level of Complexity ⁶ | | Complicated | |
| (14) Right Of Way (ROW) Phase Total | | | |
| (15) Total Project Cost - Sum of CN, PE, ROW | | \$ | 31,814,000 |

Miscellaneous Item Allowance Includes:

Environmental Mitigation, TESC, Traffic Control, Operation Change Costs, Temporary Utility Connections, Lighting, Communications, Traffic Controls, Signing, and other work.

Per Jeri Bernstein, PE, SE, proposed trestle will have a concrete bridge deck, so HMA will be retired from the LCCM.

*Temporary Buildings include Terminal Building (\$90K), Waiting Room (\$90K), Restrooms (\$54K) and Construction Trailer (\$18K)

Mark-ups for PE and CE assumed based on correlation of Project scope/type with WSDOT published guidance.

¹. Per Cost Estimating Manual for WSDOT Projects M 3034.02 (July 2009) (Table 2, low end of range unless justified.)

². Per *Plans Preparation Manual* M 22-31.01 (November 2008)

³. Per Chapter 12, *Bridge Design Manual* M 23-50.02 (May 2008)

⁴. See "Misc Item Allowance" Tab

⁵. Per Estimate Order of Calculations, Tax Rates, and 700 & 800 Items

<http://www.wsdot.wa.gov/publications/fulltext/CEVP/700%20800%20items.pdf>

⁶. See (Full Level) Predesign Study Tab for Projects over \$5M; Use 10% of PE for improvement projects under \$5M (Modified Level).

⁷. See *EBASE User's Guide*

⁸. 800-859 Level Items Apply to Federal Aide Projects; 860-899 Level Items Apply to Non-Federal Aide Projects

Alternative 4

Project Title (WIN): Vashon Trestle Preservation
WIN: M05204A
SR: SR 160
Terminal: Vashon Island Ferry Terminal
Subprogram: Preservation (W1)
Level of Estimate: Scoping
Estimate Datum Date: May-2008
Revision Number: 4
Revision Date: June-12



| SUMMARY (Basis for Capital Cost Summary Table) w/ Markups | | | |
|--|----------|-------------|---------------|
| (1) Construction Base Cost (includes mobilization ^{2,3}) | | \$ | 26,814,487.70 |
| (2) Misc. Item Allowance ^{1,4} - Percentage Applied to No. (1) | 20.00% | \$ | 5,362,897.54 |
| (3) Contract Total - Sum of (1) & (2) | Subtotal | \$ | 32,177,385.24 |
| (4) Sales Tax - (Location Dependant) Percentage Applied to No. (3) | 8.6% | \$ | 2,767,255.13 |
| (5) Estimated Construction Contract Total - Sum of (3) & (4) | Subtotal | \$ | 34,944,640.37 |
| (6) Construction Engineering ² - Percentage Applied to No. (5), & Bid Items # 700-799 | 8.0% | \$ | 2,795,571.23 |
| (7) Construction (Change Order) Contingency ^{2,5} - Percentage Applied to No. (5) & Bid Items # 700-799 | 4.0% | \$ | 1,397,785.61 |
| (8) Other Construction (Below-the-line items) ^{5,7} | | | |
| BI # 700-799: Work by Others (Non-WSDOT) - Construction Engineering and Construction (Change Order) Contingencies Apply ⁷ | | | |
| A Agreements (External) | | \$ | - |
| B Work by Other State Forces (Non-WSDOT) | | \$ | - |
| C Other | | \$ | - |
| BI # 800-899: Work to be performed by or materials furnished by WSDOT - Construction Engineering and Construction (Change Order) Contingencies Do Not Apply ^{7,8} | | | |
| D Temp. Buildings | | \$ | 252,000.00 |
| E Operations Construction Support | | \$ | 20,000.00 |
| F | | | |
| (9) Construction Phase (CN) Total ⁷ - Sum of (5), (6), (7), & (8) | | \$ | 39,410,000 |
| (10) Design Engineering ^{1,5} - Percentage Applied to No. (5) for Planning & Scoping Level Estimates, Otherwise Use Actual from PMP | 11.0% | \$ | 3,843,910.44 |
| (11) Other Design Expenses | | | |
| G Operations Design Support | | \$ | 27,500.00 |
| H Other | | \$ | - |
| I Other | | \$ | - |
| (12) Preliminary Engineering (PE) Phase Total - Sum of (10) & (11) | | | \$3,871,000 |
| (13a) Pre-Design Study (part of Design Engineering above; rounded up to nearest \$1K) - If Applicable ⁶ | | | \$260,000 |
| (13b) OFM Level of Study ⁶ | | Full | |
| (13c) Project Level of Complexity ⁶ | | Complicated | |
| (14) Right Of Way (ROW) Phase Total | | | |
| (15) Total Project Cost - Sum of CN, PE, ROW | | \$ | 43,281,000 |

Miscellaneous Item Allowance Includes:

Environmental Mitigation, TESC, Traffic Control, Operation Change Costs, Temporary Utility Connections, Lighting, Communications, Traffic Controls, Signing, and other work.

Per Jeri Bernstein, PE, SE, proposed trestle will have a concrete bridge deck, so HMA will be retired from the LCCM.

*Temporary Buildings include Terminal Building (\$90K), Waiting Room (\$90K), Restrooms (\$54K) and Construction Trailer (\$18K)

Mark-ups for PE and CE assumed based on correlation of Project scope/type with WSDOT published guidance.

¹. Per Cost Estimating Manual for WSDOT Projects M 3034.02 (July 2009) (Table 2, low end of range unless justified.)

². Per *Plans Preparation Manual* M 22-31.01 (November 2008)

³. Per Chapter 12, *Bridge Design Manual* M 23-50.02 (May 2008)

⁴. See "Misc Item Allowance" Tab

⁵. Per Estimate Order of Calculations, Tax Rates, and 700 & 800 Items

<http://www.wsdot.wa.gov/publications/fulltext/CEVP/700%20800%20items.pdf>

⁶. See (Full Level) Predesign Study Tab for Projects over \$5M; Use 10% of PE for improvement projects under \$5M (Modified Level).

⁷. See *EBASE User's Guide*

⁸. 800-859 Level Items Apply to Federal Aide Projects; 860-899 Level Items Apply to Non-Federal Aide Projects

APPENDIX D

Asset Management Model



Date June 21, 2012
From Darin Johnson
To Charles Torres
Nicole McIntosh
Regarding Vashon Terminal options analysis
Preliminary results, summary of assumptions

Option 2A – seismic refurbishment with cradle

| ITEM | ASSUMPTION |
|--------------------------|---|
| Description | Seismic bracing is installed immediately, along with provisions for the future cradle and replacement of the highest-risk existing bents. Utility work (esp. stormwater) is required as part of this. |
| Net benefit (NPV) | -\$5.2 million (i.e., net cost) |
| Capital cost | Cost of terminal building (\$900,000) and bulkhead (\$1.1 million), and are excluded. |
| Future maintenance | Future maintenance includes incorporation of the existing bents into the cradle system on an as-needed basis; the rate is projected using the historical rate of bent failure, resulting in the last bent being converted in about 25 years. |
| Seismic consequences | Seismic consequences are based on the assumptions provided by the seismic assessment team as shown in the workbook. It is assumed that at least one terminal off the island will be operable up to the thousand-year event in the do-nothing case. |
| Benefit of refurbishment | <p>Per the work by Geo and KPFF, the seismic bracing supports the structure through the thousand-year event. Risk from events beyond this is not considered in any scenario.</p> <p>The cradle system, once it is complete, precludes the need for future maintenance on the piles, bents, caps, etc.</p> |

Option 2B – Seismic refurbishment, bracing only

| ITEM | ASSUMPTION |
|--------------------------|--|
| Description | Seismic bracing is installed; other maintenance continues as-is. Utility work and replacement of the terminal building are not required. |
| Net benefit (NPV) | \$7.4 million (i.e., net benefit) |
| Capital cost | Cost of terminal building (\$900,000) bulkhead (\$1.1 million), provisions for bracing (\$7.4 million), and utilities (\$2.0 million) are excluded from the cost of Option 2A. |
| Future maintenance | Future maintenance costs are assumed to increase with the square of age from the current level (\$800,000 every three years). Bents and other components are not replaced except on an as-needed basis. |
| Seismic consequences | Seismic consequences are based on the assumptions provided by the seismic assessment team as shown in the workbook. It is assumed that at least one terminal off the island will be operable up to the thousand-year event in the do-nothing case. |
| Benefit of refurbishment | Per the work by Geo and KPFF, the seismic bracing supports the structure through the thousand-year event. Risk from events beyond this is not considered in any scenario. |

Option 3 – “Vital link”

| ITEM | ASSUMPTION |
|--------------------------|--|
| Description | Replacement of about half the trestle to ensure service to the island in case of earthquake. The remainder remains in place with ongoing maintenance. We assume that the utility work (esp. stormwater) will be required. |
| Net benefit (NPV) | -\$10.7 million (i.e., net cost) |
| Capital cost | Cost of terminal building (\$900,000) and bulkhead (\$1.1 million) are excluded. |
| Future maintenance | Future maintenance costs are assumed to increase with the square of age from the current level (\$800,000 every three years), but scaled back to 40 percent of the cost in the do-nothing case. |
| Seismic consequences | Seismic consequences are based on the assumptions provided by the seismic assessment team as shown in the workbook. It is assumed that at least one terminal off the island will be operable up to the thousand-year event in the do-nothing case. |
| Benefit of refurbishment | Structure is seismically stable through the thousand-year event. Maintenance cost is reduced. |

Option 4 – Immediate replacement

| ITEM | ASSUMPTION |
|------------------------|--|
| Description | Replacement of the entire trestle. |
| Net benefit (NPV) | -\$19.1 million (i.e., net cost) |
| Capital cost | Cost of the bulkhead (\$1.1 million) has been excluded because it is nearly a break-even project on its own. |
| Future maintenance | Future maintenance costs drop to zero. |
| Seismic consequences | Seismic consequences are based on the assumptions provided by the seismic assessment team as shown in the workbook. It is assumed that at least one terminal off the island will be operable up to the thousand-year event in the do-nothing case. |
| Benefit of replacement | Structure is seismically stable through the thousand-year event. Maintenance costs are effectively eliminated. |

Vashon Trestle Option 2A - refurbishment with cradle system
Summary of results

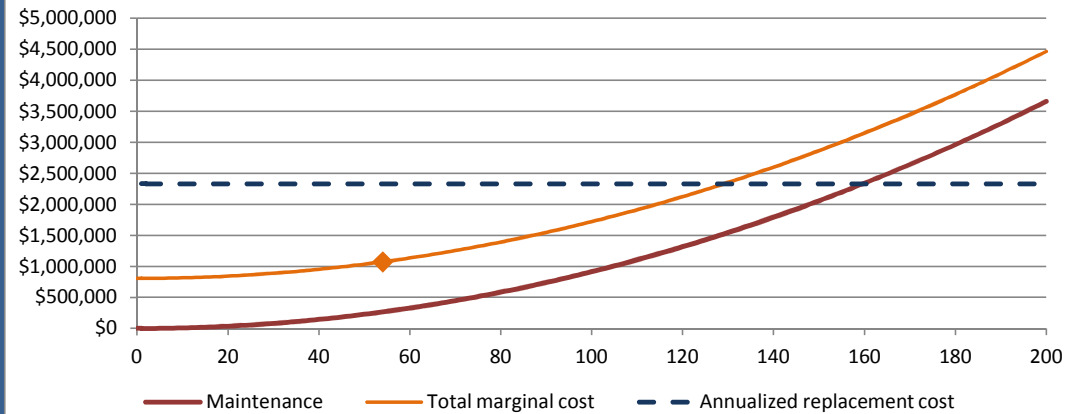
| | |
|-------------------------------|-------------|
| Discount rate | 5.30% |
| Current Age | 54 |
| Current annual maintenance | \$266,667 |
| Annual seismic risk (current) | \$807,383 |
| Current annual cost | \$1,074,049 |
| Annual cost at refurbishment | \$1,032,935 |

Replacement

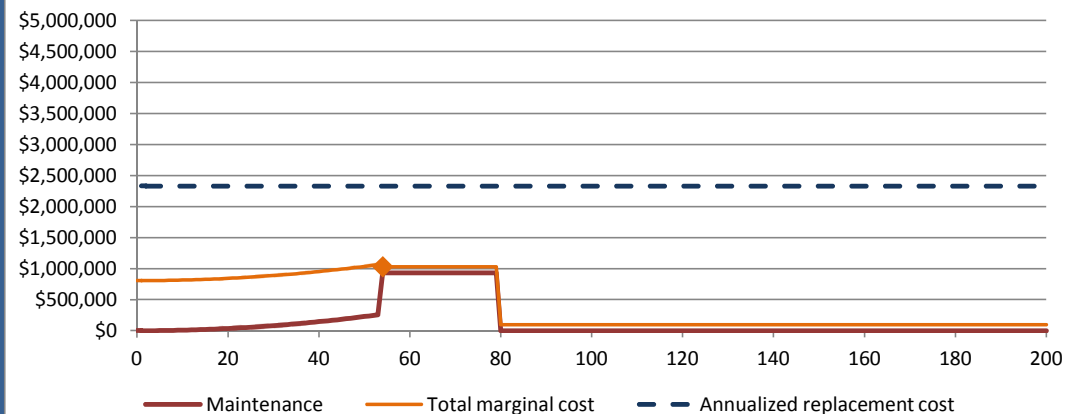
| | |
|--------------------------------------|---------------|
| Replacement Cost | \$42,100,000 |
| Annual seismic risk (new) | \$99,602 |
| Years to optimal replacement | |
| NPV of optimal replacement | \$24,841,949 |
| NPV of immediate replacement | \$43,979,282 |
| Net benefit of immediate replacement | -\$19,137,332 |

| | |
|------------------------------|--------------|
| Refurbishment cost | \$15,200,000 |
| Seismic risk (refurb) | \$99,602 |
| NPV of refurbishment | \$30,090,768 |
| Net benefit of refurbishment | -\$5,248,819 |

Current life-cycle cost



Life-cycle cost after refurbishment



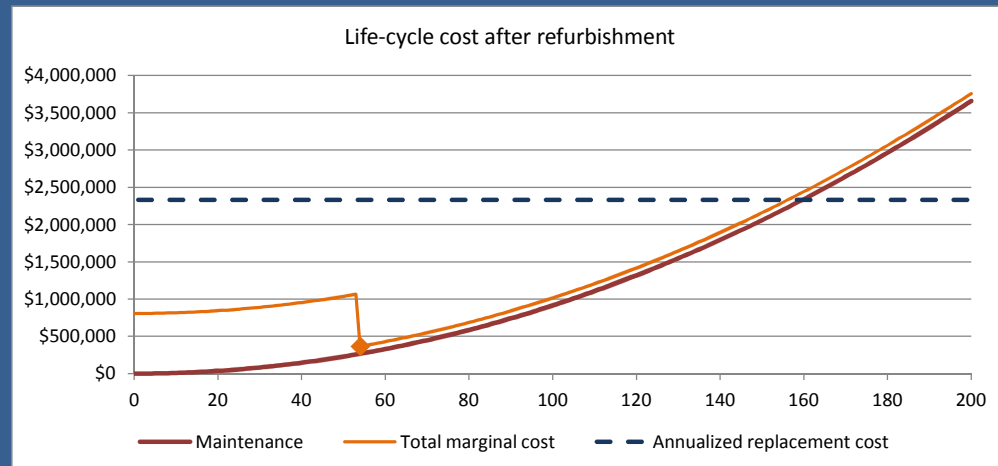
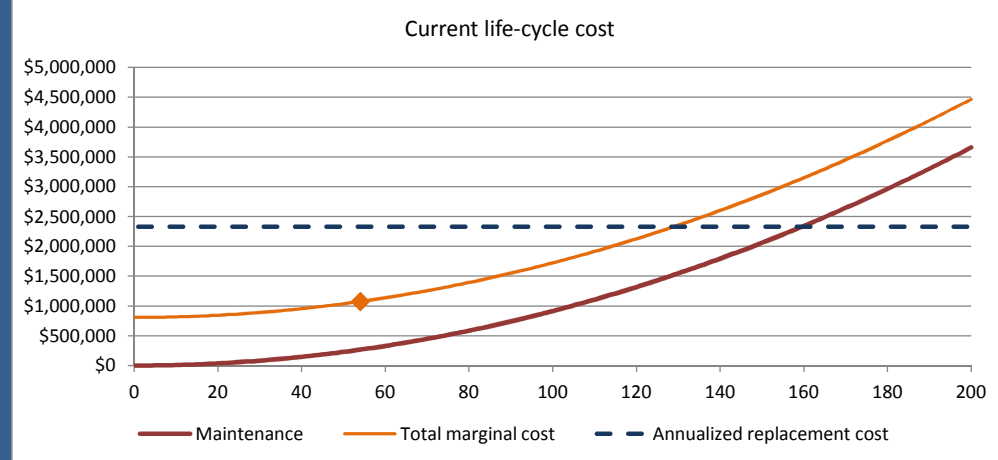
Vashon Trestle, Option 2B - Refurbishment with bracing only
Summary of results

| | |
|-------------------------------|-------------|
| Discount rate | 5.30% |
| Current Age | 54 |
| Current annual maintenance | \$266,667 |
| Annual seismic risk (current) | \$807,383 |
| Current annual cost | \$1,074,049 |
| Annual cost at refurbishment | \$366,269 |

Replacement

| | |
|--------------------------------------|---------------|
| Replacement Cost | \$42,100,000 |
| Annual seismic risk (new) | \$99,602 |
| Years to optimal replacement | |
| NPV of optimal replacement | \$24,841,949 |
| NPV of immediate replacement | \$43,979,282 |
| Net benefit of immediate replacement | -\$19,137,332 |

| | |
|------------------------------|--------------|
| Refurbishment cost | \$5,800,000 |
| Seismic risk (refurb) | \$99,602 |
| NPV of refurbishment | \$17,429,470 |
| Net benefit of refurbishment | \$7,412,479 |



Vashon Trestle, Option 3 - "Vital link"

Summary of results

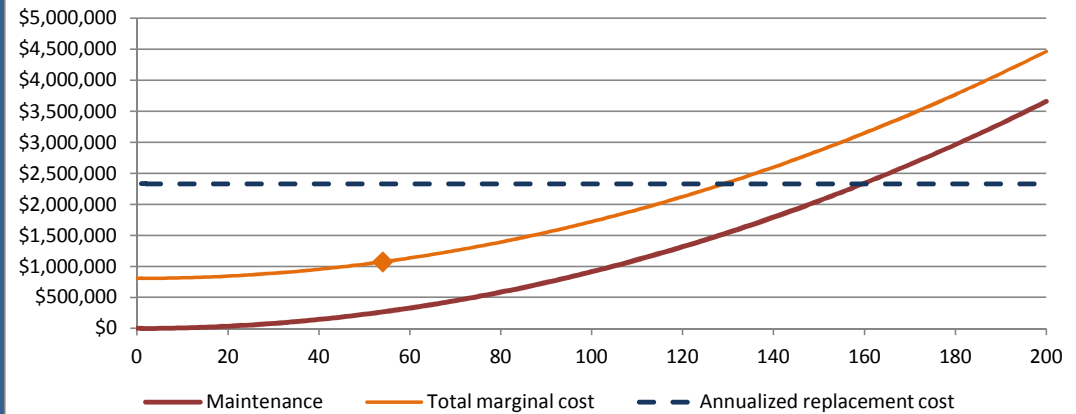
| | |
|-------------------------------|-------------|
| Discount rate | 5.30% |
| Current Age | 54 |
| Current annual maintenance | \$266,667 |
| Annual seismic risk (current) | \$807,383 |
| Current annual cost | \$1,074,049 |
| Annual cost at refurbishment | \$206,269 |

Replacement

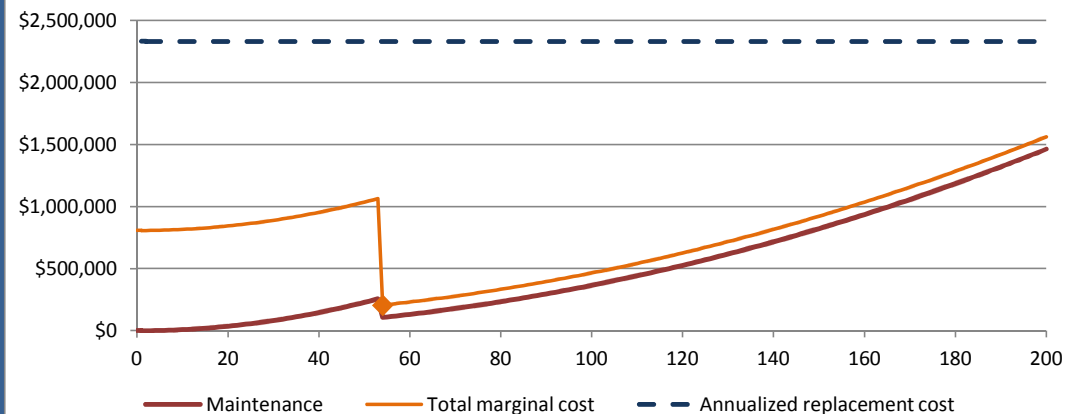
| | |
|--------------------------------------|---------------|
| Replacement Cost | \$42,100,000 |
| Annual seismic risk (new) | \$99,602 |
| Years to optimal replacement | |
| NPV of optimal replacement | \$24,841,949 |
| NPV of immediate replacement | \$43,979,282 |
| Net benefit of immediate replacement | -\$19,137,332 |

| | |
|------------------------------|---------------|
| Refurbishment cost | \$29,800,000 |
| Seismic risk (refurb) | \$99,602 |
| NPV of refurbishment | \$35,602,345 |
| Net benefit of refurbishment | -\$10,760,396 |

Current life-cycle cost

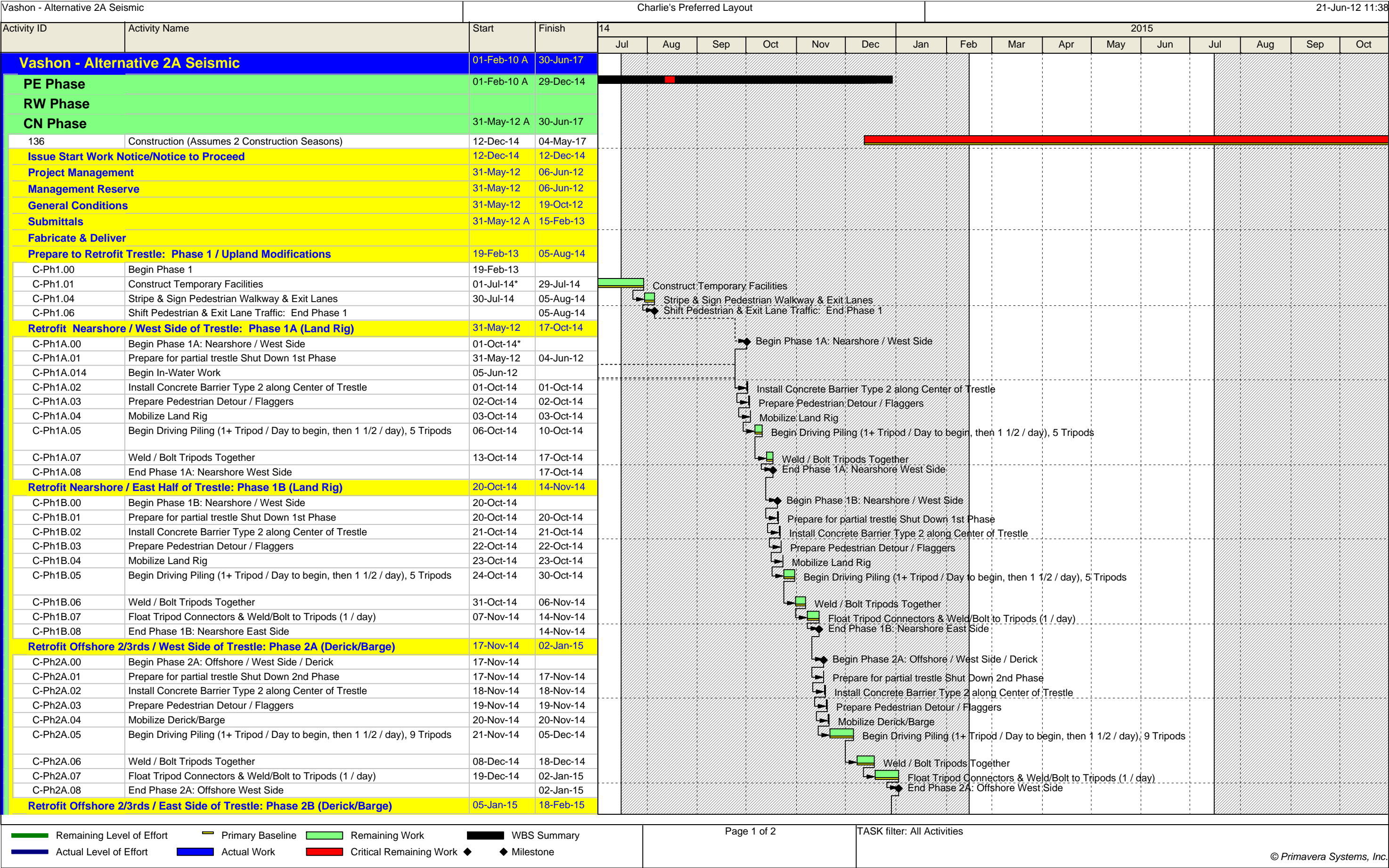


Life-cycle cost after refurbishment


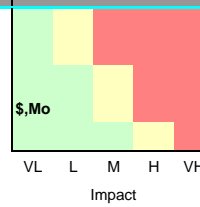
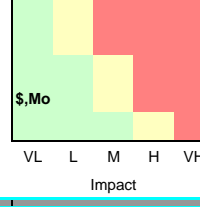
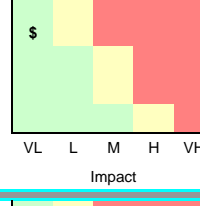
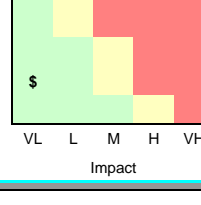



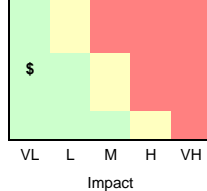
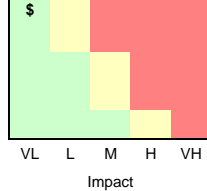
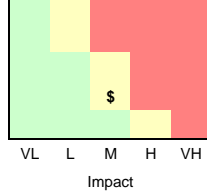
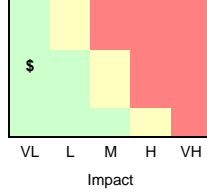
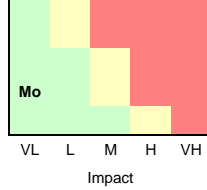
APPENDIX E

Schedule



| Vashon - Alternative 2A Seismic | | | Charlie's Preferred Layout | | | | | | | | 2015 | | | | | | | | | | 21-Jun-12 11:38 | | | |
|--|--|-----------|----------------------------|-----|-----|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|--|-----------------|--|--|--|
| Activity ID | Activity Name | Start | Finish | 14 | | | | | | | | | | | | | | | | | | | | |
| | | | | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | | | | | |
| C-Ph2B.00 | Begin Phase 2B: Offshore 2/3rds / East Side of Trestle / Derick | 05-Jan-15 | | | | | | | | | | | | | | | | | | | | | | |
| C-Ph2B.01 | Prepare for partial trestle Shut Down 2nd Phase | 05-Jan-15 | 05-Jan-15 | | | | | | | | | | | | | | | | | | | | | |
| C-Ph2B.02 | Install Concrete Barrier Type 2 along Center of Trestle | 06-Jan-15 | 06-Jan-15 | | | | | | | | | | | | | | | | | | | | | |
| C-Ph2B.03 | Prepare Pedestrian Detour / Flaggers | 07-Jan-15 | 07-Jan-15 | | | | | | | | | | | | | | | | | | | | | |
| C-Ph2B.04 | Mobilize Derick/Barge | 08-Jan-15 | 08-Jan-15 | | | | | | | | | | | | | | | | | | | | | |
| C-Ph2B.05 | Begin Driving Piling (1+ Tripod / Day to begin, then 1 1/2 / day), 9 Tripods | 09-Jan-15 | 22-Jan-15 | | | | | | | | | | | | | | | | | | | | | |
| C-Ph2B.051 | End In-Water Work | | 22-Jan-15 | | | | | | | | | | | | | | | | | | | | | |
| C-Ph2B.06 | Weld / Bolt Tripods Together | 23-Jan-15 | 04-Feb-15 | | | | | | | | | | | | | | | | | | | | | |
| C-Ph2B.07 | Float Tripod Connectors & Weld/Bolt to Tripods (1 / day) | 05-Feb-15 | 18-Feb-15 | | | | | | | | | | | | | | | | | | | | | |
| C-Ph2B.08 | End Phase 2B: Retrofit Offshore 2/3rds / East Side of Trestle | | 18-Feb-15 | | | | | | | | | | | | | | | | | | | | | |
| Interconnect Tripods Longitudinally & Horizontally: Phase 2C | | 19-Feb-15 | 06-Apr-15 | | | | | | | | | | | | | | | | | | | | | |
| C-Ph2C.00 | Begin Phase 2C: Interconnect Tripods Longitudinally & Horizontally | 19-Feb-15 | | | | | | | | | | | | | | | | | | | | | | |
| C-Ph2C.01 | Weld / Bolt Longitudinal & Horizont Steel Members to Tripods | 19-Feb-15 | 20-Mar-15 | | | | | | | | | | | | | | | | | | | | | |
| C-Ph2C.02 | Install Blocking Between Timber Trestle & Seismic Supports / Tripods | 23-Mar-15 | 06-Apr-15 | | | | | | | | | | | | | | | | | | | | | |
| C-Ph2C.03 | End Phase 2C: Terminal Building Demolision | | 06-Apr-15 | | | | | | | | | | | | | | | | | | | | | |
| Clean Up & Demob: Phase 3 | | 07-Apr-15 | 10-Apr-15 | | | | | | | | | | | | | | | | | | | | | |
| C-Ph3.00 | Clean Up & Demob | 07-Apr-15 | | | | | | | | | | | | | | | | | | | | | | |
| C-Ph3.01 | Remove Temporary Pedestrian Reroute Signs & Conc. Barriers | 07-Apr-15 | 08-Apr-15 | | | | | | | | | | | | | | | | | | | | | |
| C-Ph3.02 | Clean Up | 09-Apr-15 | 10-Apr-15 | | | | | | | | | | | | | | | | | | | | | |
| C-Ph3.11 | End Phase 3: East Half of Trestle | | 10-Apr-15 | | | | | | | | | | | | | | | | | | | | | |
| Trestle Operationally Complete | | 04-May-17 | 04-May-17 | | | | | | | | | | | | | | | | | | | | | |
| 137 | Trestle Operationally Complete | 04-May-17 | | | | | | | | | | | | | | | | | | | | | | |
| CN.10.4 | Operationally Complete | 04-May-17 | | | | | | | | | | | | | | | | | | | | | | |
| Complete Contract | | 04-May-17 | 30-Jun-17 | | | | | | | | | | | | | | | | | | | | | |
| 139 | Complete Contract | 04-May-17 | 30-Jun-17 | | | | | | | | | | | | | | | | | | | | | |
| 140 | Final Inspection | 04-May-17 | | | | | | | | | | | | | | | | | | | | | | |
| 141 | Complete Punchlist | 04-May-17 | 30-Jun-17 | | | | | | | | | | | | | | | | | | | | | |
| Construction & Closeout | | 31-May-12 | 06-Jun-12 | | | | | | | | | | | | | | | | | | | | | |
| A1280 | Construction Closeout | 31-May-12 | 06-Jun-12 | | | | | | | | | | | | | | | | | | | | | |

| Project Title | | Vashon Trestle Preservation (Alt 2B): Refurbishment | | | | | Value | | Variability | | Risk Markups | | WSDOT Escalation tables built-in. | | % | Total Cost CY [\$M] | Total Cost YOY [\$M] | | Ad Date | |  | End Construction date | | WSDOT Ovidiu Cretu 360-705-7599 | | | |
|---|--------|---|------------------|---|--|--------------------------|-------|-------------------------|-------------------------|---------|-----------------------|--|-----------------------------------|--|---|---------------------|---|---------------------------|------------|---|--|------------------------|---------------------------|---------------------------------|--|--|--|
| Estimate Date | | 06/21/12 | | | | Target AD date | | 04/14/14 | | 10% | | Mob | | 10.0% | | A/B/A Duration | | 50 | 46.53 | | 59.02 | | | | | | |
| Project PIN # | | | | | | Estimated CN Duration | | 252.0Mo | | 10% | | Tax | | 8.6% | | on-WSDOT rate | | YOY | 60 | 47.47 | | 60.20 | | | | | |
| Last Review Date | | 06/21/12 | | | | Estimated PE Cost | | 3.22 \$M | | 10% | | CE | | 11.0% | | PE | | | 3.3\$M | 70 | 48.39 | | 61.41 | | | | |
| Project Manager | | Charlie Torres | | | | Estimated ROW Cost | | | | 10% | | PE | | 9.1% | | ROW | | | 0.0\$M | 80 | 49.48 | | 62.79 | | | | |
| | | | | | | Estimated CN Cost | | 43.00 \$M | | 10% | | C.O.C | | 4.0% | | CN | | | 55.3\$M | 90 | 50.92 | | 64.65 | | | | |
| The yellow highlighted cells have to be filled in order for macro to run correctly. The light green highlighted cells may be filled if you know what you are doing. !!!!!!! Existing (Pre-Mitigated) Design!!!!!!!!!!!!Created and Maintained by WSDOT, contact Ovidiu Cretu 360-705-7599, ccretuo@wsdot.wa.gov | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Risk Identification | | | | | | Quantitative Analysis | | | | | | Qualitative Display of the Best Guess Impact | | | | | | Risk Response Plan | | | | Monitoring and Control | | Critical Issue | | | |
| Risk # | Status | Dependency | Project Phase | Summary Description Threat and/or Opportunity | Detailed Description of Risk Event (Specific, Measurable, Attributable, Relevant, Timebound) [SMART] | Risk Trigger | Type | Probability/Correlation | Risk Impact (\$M or Mo) | | Expected Impact (\$M) | Probability (%) | Impact | Risk Matrix (Probability of Occurrence by Expected Impact) | | Strategy | ACTION TO BE TAKEN Response Actions including advantages and disadvantages include date | | Risk Owner | Risk Review Dates | Date, Status and Review Comments (Do not delete prior comments, therefore providing a history) | | Is Risk on Critical Path? | | | | |
| (1) | (2) | (3) | (5) | (6) | (7) | (8) | (9) | (10) | [10a] | (11) | (12) | (13) | (14) | (15) | | (16) | (17) | | (18) | (19) | (20) | | (21) | | | | |
| 1 | Active | | Pre-construction | Threat | The refurbishment alternative leaves creosote timbers in place for as many as 25 more years, increases over water coverage slightly, and increases benthic coverage. It also requires the Tribes to assist in 5 separate projects verses 1 or 2. | Selection of alternative | Cost | 25% | MIN | 0.10\$M | 0.05\$M | Low | Very Low | Probability |  | Mitigation | Meet with the Tribes, invite Management, propose mitigation. Develop plan to remove creosote treated timbers in the future (give specific dates if possible), and plan to treat surface water and mitigate for additional overwater coverage. | Philip Narte | 6/16/2012 | 4/24/12: Phillip Narte emails Puyallup Tribe requesting an update meeting. 5/24/12: Meet w/ Phillip Narte and Puyallup Tribe in Fife to provide project update. | YES | | | | | | |
| | | | | MAX | | | | | 0.30\$M | | | | | | | | | | | | | | | | | | |
| | | | | Most Likely | | | | | 0.20\$M | | | | | | | | | | | | | | | | | | |
| | | | | Master Duration Risk | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 0 | | | | | | MIN | | | | | | | | | | | | 3.0Mo | 1.5Mo | Very Low | | | |
| MAX | 9.0Mo | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Most Likely | 6.0Mo | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Schedule | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Active | | Pre-construction | Threat | Mitigation will be required for additional overwater coverage, benthic impact. Inconsistent with A Report From The Indian Treaty Tribes In Western Washington: Treaty Rights At Risk, July 14, 2011. | Selection of alternative | Cost | 25% | MIN | 0.05\$M | 0.06\$M | Low | Very Low | Probability |  | Mitigation | Discuss mitigation strategy with TE Management. Plan to mitigate or revise chosen alternative. | Rick Huey | 6/15/2012 | Rick Huey to reach out / partner with NOAA to try get a feel for what they want, how they see the alternative. | YES | | | | | | |
| | | | | MAX | | | | | 0.50\$M | | | | | | | | | | | | | | | | | | |
| | | | | Most Likely | | | | | 0.25\$M | | | | | | | | | | | | | | | | | | |
| | | | | 0 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 2 | | | | | | MIN | | | | | | | | | | | | 3.0Mo | 1.6Mo | Very Low | | | |
| MAX | 12.0Mo | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Most Likely | 6.0Mo | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Schedule | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Active | | Pre-construction | Threat | Accepting Federal Funds will force us to address ADA and stormwater treatment issues. 2 alternatives do not address salmon recovery issues. | Selection of alternative | Cost | 75% | MIN | 0.05\$M | 0.08\$M | High | Very Low | Probability |  | Acceptance | Assuming we chose the alternatives that don't meet ADA and stormwater treatment requirements, revise design to include some ADA and stormwater improvements. Widening the trestle to include a wider pedestrian walkway and trigger relocating utilities and/or increasing the trestle footprint which would trigger additional mitigation. | Steve Levengood | 6/15/2012 | PM to work with Steve Levengood and Ed Barry to come up with an acceptable plan for ADA | YES | | | | | | |
| | | | | MAX | | | | | 0.20\$M | | | | | | | | | | | | | | | | | | |
| | | | | Most Likely | | | | | 0.10\$M | | | | | | | | | | | | | | | | | | |
| | | | | Master Duration Risk | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 0 | | | | | | MIN | | | | | | | | | | | | | 0.0Mo | Insignificant | | | |
| MAX | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Most Likely | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Schedule | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Active | | Pre-construction | Threat | In the eyes of some in the community, 2 alternatives appear to ignore the potential impacts on residents should an earthquake hit. The community opposition movement is well organized and vocal. | Selection of alternative | Cost | 25% | MIN | 0.05\$M | 0.03\$M | Low | Very Low | Probability |  | | Tell the community the truth, we don't have the money for the alternative they want. They'll have to continue living with the risk. | David Mosely/Marta Corsey | 6/15/2012 | Customer Outreach/Communicaitons to assist | YES | | | | | | |
| | | | | MAX | | | | | 0.15\$M | | | | | | | | | | | | | | | | | | |
| | | | | Most Likely | | | | | 0.10\$M | | | | | | | | | | | | | | | | | | |
| | | | | 0 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 4 | | | | | | MIN | | | | | | | | | | | | | 0.0Mo | Insignificant | | | |
| MAX | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Most Likely | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Schedule | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Project Title | | Vashon Trestle Preservation (Alt 2B): Refurbishment | | | | | Value | | Variability | | Risk Markups | | WSDOT Escalation tables built-in. | | % | Total Cost CY [\$M] | Total Cost YOE [\$M] | Ad Date | |  | End Construction date | | WSDOT Ovidiu Cretu 360-705-7599 | | | | |
|---|--------|---|------------------|--|---|---|-----------|-------------------------|---------------------------|-------------------------------|-----------------------|--|-----------------------------------|--|---|---------------------|---|----------------|--------------|---|--|-----|---------------------------------------|------------------|--|------------------|--|
| Estimate Date | | 06/21/12 | | | | Target AD date | | 04/14/14 | | 10% | | Mob | | 10.0% | | A/B/A Duration | | 50 | June 7, 2014 | | 50% | | July 27, 2035 | | | | |
| Project PIN # | | | | The above macro should be activated to generate the final results. Do not stop it if it is running. | | Estimated CN Duration | | 252.0Mo | | 10% | | Tax | | 8.6% | | on-WSDOT rate | | YOE | 60 | July 30, 2014 | | 60% | | October 19, 2035 | | | |
| Last Review Date | | 06/21/12 | | | | Estimated PE Cost | | 3.22 \$M | | 10% | | CE | | 11.0% | | PE | | 3.3\$M | | 70 | August 31, 2014 | | 70% | | | January 14, 2036 | |
| Project Manager | | Charlie Torres | | | | Estimated ROW Cost | | | | 10% | | PE | | 9.1% | | ROW | | 0.0\$M | | 80 | September 25, 2014 | | 80% | | | April 25, 2036 | |
| | | | | | | Estimated CN Cost | | 43.00 \$M | | 10% | | C.O.C | | 4.0% | | CN | | 55.3\$M | | 90 | October 27, 2014 | | 90% | | | August 28, 2036 | |
| The yellow highlighted cells have to be filled in order for macro to run correctly. The light green highlighted cells may be filled if you know what you are doing. !!!!!!! Existing (Pre-Mitigated) Design!!!!!!!!!!!!Created and Maintained by WSDOT, contact Ovidiu Cretu 360-705-7599, ccretuo@wsdot.wa.gov | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Risk Identification | | | | | Quantitative Analysis | | | | | | | Qualitative Display of the Best Guess Impact | | | | | Risk Response Plan | | | Monitoring and Control | | | Critical Issue | | | | |
| Risk # | Status | Dependency | Project Phase | Summary Description Threat and/or Opportunity | Detailed Description of Risk Event (Specific, Measurable, Attributable, Relevant, Timebound) [SMART] | Risk Trigger | Type | Probability/Correlation | Risk Impact (\$M or Mo) | | Expected Impact (\$M) | Probability (%) | Impact | Risk Matrix (Probability of Occurrence by Expected Impact) | | Strategy | ACTION TO BE TAKEN Response Actions including advantages and disadvantages include date | | Risk Owner | Risk Review Dates | Date, Status and Review Comments (Do not delete prior comments, therefore providing a history) | | Is Risk on Critical Path? | | | | |
| (1) | (2) | (3) | (5) | (6) | (7) | (8) | (9) | (10) | [10a] | (11) | (12) | (13) | (14) | (15) | | (16) | (17) | | (18) | (19) | (20) | | (21) | | | | |
| 5 | Active | | Pre-construction | Threat Insufficient funds | Project alternative is not fully funded | 30% estimate comes in higher than budget | Cost 0 | 50% | MIN MAX Most Likely | 0.01\$M 0.05\$M 0.03\$M | 0.02\$M | Moderate | Very Low | Probability VH H M L VL  VL L M H VH Impact | | | Plan to scale back project: leave terminal building in place or don't replace all of the outer trestle which is the most vulnerable. | Charlie Torres | 6/15/2012 | Track estimates. Work with Steve Levensgood and discipline leads to develop a more thorough estimate. If we still have insufficient funds, cut scope (don't replace seawall or terminal building?) | | YES | | | | | |
| 6 | Active | | Pre-construction | Threat Selection of Rehabilitation alternative makes it difficult/impossible to implement lane & sidewalk width standards | Recently adapted standards are more difficult and costly to apply. Not doing so results in long term impacts to Operations. | Selection of alternative | Cost 6 | 90% | MIN MAX Most Likely | 0.05\$M 0.25\$M 0.10\$M | 0.11\$M | Very High | Very Low | Probability VH H M L VL  VL L M H VH Impact | | | Work with various agencies and ASDE to develop a plan to satisfy them. May result if follow up mini-projects | Charlie Torres | 6/15/2012 | Reach out to those who have an interest in meeting standards (Operations, ASDE) and talk to them about the project alternative to see if we can find common ground to gain their support | | YES | | | | | |
| 7 | Active | | | | Project does not go to Construction due to opposition | Alternative Selection does not get permitted. Design Team Spends \$3.2M PE budget and has to start all over as project is canceled | Cost 0 | 25% | MIN MAX Most Likely | 0.00\$M 3.20\$M 1.60\$M | 0.40\$M | Low | Moderate | Probability VH H M L VL  VL L M H VH Impact | | | Start all over. Open up new work order. Start new PMP/PDS | | | 6/15/12: The PM and Management may revise the scope of this alternative; they may delete stormwater treatment or replacement of creosote treated timbers as a cost cutting measure. They may only want to seismically | | YES | | | | | |
| 8 | Active | | | | ESA/MMPA triggers compliance NEW issues that could impact schedule for construction | Compliance with ESA will require a biological evaluation of the existing habitat and species potentially impacted by the project during and after construction. Marbled Murrelet have impacted pile driving on other projects requiring Contractors to stop work. What about the Giant Plumose Anemone? Also impacts negotiations with tribe for permits. | Cost 8 | 50% | MIN MAX Most Likely | 0.05\$M 0.25\$M 0.15\$M | 0.08\$M | Moderate | Very Low | Probability VH H M L VL  VL L M H VH Impact | | | Following field investigations by biologists, use any lessons learned from past projects and/or develop special provisions to include in the contract as part of permit approval process. | | | | | YES | | | | | |
| 9 | Active | | | | Inconsistent with the Puget Sound (Clean Up) Initiative | The Governor has a goal of cleaning up toxic chemicals, restoring waterways and salmon habitat, in the Puget Sound in the next 20 years. The refurbishment alternative does not address this issue. | Cost 0 | 20% | MIN MAX Most Likely | 0.01\$M 0.03\$M 0.02\$M | 0.00\$M | Low | Insignificant | Probability VH H M L VL  VL L M H VH Impact | | | Talk to the State Officials about mitigation | | | Coordinate via Management, Confidence Reports, Gary Lebow, Firas Makhoul | | YES | | | | | |

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| C-Ph1.06 | Shift Pedestrian Traffic to Temporary Walkway: End Phase 1 | | 17-Dec-14 | |
| Prepare to Replace West Half of Trestle, Nearshore: Phase 2A / 1st CN Season | | 31-May-12 | 17-Jun-15 | |
| C-Ph2A.00 | Begin Phase 2A: Nearshore | 18-Dec-14 | | |
| C-Ph2A.01 | Prepare for partial trestle Shut Down 2nd Phase | 31-May-12 | | |
| C-Ph2A.02 | Install Concrete Barrier Type 2 along Center of Trestle | 18-Dec-14 | 24-Dec-14 | |
| C-Ph2A.03 | Demo Existing 8x12 Curb, Utilities, Rail | 26-Dec-14 | 02-Jan-15 | |
| C-Ph2A.04 | Demo ACP/Deck: West Side | 05-Jan-15 | 09-Jan-15 | |
| C-Ph2A.05 | Demo Piles: West Side | 12-Jan-15 | 16-Jan-15 | |
| C-Ph2A.06 | Demo Sea Wall: West Side | 20-Jan-15 | 26-Jan-15 | |
| C-Ph2A.07 | Construct Sea Wall: West Side | 27-Jan-15 | 17-Feb-15 | |
| C-Ph2A.08 | Construct Upland Stormwater Treatment Facility | 18-Feb-15 | 03-Mar-15 | |
| C-Ph2A.09 | Complete Upland Work Around Seawall / Approach Slab | 04-Mar-15 | 10-Mar-15 | |
| C-Ph2A.10 | Install Concrete Piles: Begin at Shore and work out; ~40 piles in phase 2A | 11-Mar-15 | 31-Mar-15 | |
| C-Ph2A.11 | CIP Pile Caps | 01-Apr-15 | 05-May-15 | |
| C-Ph2A.12 | Cure CIP Pile Caps | 06-May-15 | 27-May-15 | |
| C-Ph2A.13 | Install Deck Panels | 28-May-15 | 17-Jun-15 | |
| C-Ph2A.14 | Storm Sewer System, x | 06-May-15 | 12-May-15 | |
| C-Ph2A.15 | Handrail, x | 31-May-12 | 06-Jun-12 | |
| C-Ph2A.16 | Sewer System, x | 07-Jun-12 | 13-Jun-12 | |
| C-Ph2A.17 | Potable Water, x | 07-Jun-12 | 13-Jun-12 | |
| C-Ph2A.18 | CIP Topping Slab (after 2C) | 13-May-15 | 27-May-15 | |
| C-Ph2A.19 | Stripping (after 2C) | 28-May-15 | 03-Jun-15 | |
| C-Ph2A.20 | End Phase 2A: Nearshore (feather in CIP topping for first 2 or 3 bents), 1/2 staging, 1/2 vehicles | | 17-Jun-15 | |
| Prepare to Replace West Half of Trestle, Mid-Section: Phase 2B / 1st CN Season | | 31-May-12 | 09-Oct-15 | |
| C-Ph2B.00 | Begin Phase 2B: Offshore / Overwater / Derick | 18-Jun-15 | | |
| C-Ph2B.01 | Drive pile for work platform at mid-trestle, West Side | 18-Jun-15 | 24-Jun-15 | |
| C-Ph2B.02 | Demo Existing 8x12 Curb, Utilities, Rail | 25-Jun-15 | 01-Jul-15 | |
| C-Ph2B.03 | Demo ACP/Deck: West Side | 02-Jul-15 | 09-Jul-15 | |
| C-Ph2B.04 | Demo Piles: West Side | 10-Jul-15 | 16-Jul-15 | |
| C-Ph2B.05 | Install Concrete Piles: Begin at Shore and work out; ~40 piles in phase | 17-Jul-15 | 30-Jul-15 | |
| C-Ph2B.06 | CIP Pile Caps | 31-Jul-15 | 03-Sep-15 | |
| C-Ph2B.07 | Cure CIP Pile Caps | 04-Sep-15 | 25-Sep-15 | |
| C-Ph2B.08 | Install Deck Panels | 28-Sep-15 | 09-Oct-15 | |
| C-Ph2B.09 | Storm Sewer System, x | 31-May-12 | 06-Jun-12 | |
| C-Ph2B.10 | Handrail, x | 07-Jun-12 | 13-Jun-12 | |
| C-Ph2B.11 | Sewer System, x | 14-Jun-12 | 20-Jun-12 | |
| C-Ph2B.12 | Potable Water, x | 21-Jun-12 | 27-Jun-12 | |
| C-Ph2B.13 | CIP Topping Slab (probably not) | 28-Jun-12 | 12-Jul-12 | |
| C-Ph2B.14 | Stripping, x | 13-Jul-12 | 19-Jul-12 | |
| C-Ph2B.15 | End Phase 2B: Offshore / Overwater / Derick | | 09-Oct-15 | |
| Prepare to Replace West Half of Trestle, Up to TB: Phase 2C / 1st CN Season | | 12-Oct-15 | 01-Mar-16 | |
| C-Ph2C.00 | Begin Phase 2C: Offshore / Overwater / Derick | 12-Oct-15 | | |
| C-Ph2C.01 | Demo Existing 8x12 Curb, Utilities, Rail | 12-Oct-15 | 16-Oct-15 | |
| C-Ph2C.02 | Demo ACP/Deck: West Side | 19-Oct-15 | 23-Oct-15 | |
| C-Ph2C.03 | Demo Piles: West Side | 26-Oct-15 | 30-Oct-15 | |
| C-Ph2C.04 | Install Concrete Piles: Begin at Shore and work out; ~40 piles in phase | 02-Nov-15 | 16-Nov-15 | |
| C-Ph2C.05 | CIP Pile Caps | 17-Nov-15 | 23-Dec-15 | |
| C-Ph2C.06 | Cure CIP Pile Caps | 24-Dec-15 | 15-Jan-16 | |
| C-Ph2C.07 | Install Deck Panels | 19-Jan-16 | 01-Feb-16 | |

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| SR 160/Vashon Tml - Timber Trestle Terminal Replacement | | | | Charlie's Preferred Layout | | | | | | | | | | | | 20-Jun-12 11:45 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Activity ID | Activity Name | Start | Finish | 14 | | | | | 2015 | | | | | | | | | | 2016 | | | | | | | | | | 2017 | | | | | | | | | | 2018 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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APPENDIX F

Existing Facility Photographs

EXISTING FACILITY PHOTOGRAPHS

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Figure 1 Vashon Ferry Terminal Oblique



Figure 2 Vashon Ferry Terminal Oblique



Figure 3 Upland Vehicle Holding



Figure 4 King County Passenger Only Ferry Service



Figure 5 Bottleneck of Roadway at Bulkhead



Figure 6 Beach Access Ramp



Figure 7 Terminal Building Elevation



Figure 8 Trestle Substructure at Terminal Building



Figure 9 Slips 1 & 2



Figure 10 Vehicle Holding Area



Figure 11 Passenger Waiting Area



Figure 12 Sanitary Holding Tank



Figure 13 Pedestrian Access Walkway and Curb



Figure 14 Storm Drainage System



Figure 15 Timber Pile



Figure 16 Timber Beam



Figure 17 Timber Beam



Figure 18 Eastern Barrier and Railing



Figure 19 Cracking on Bulkhead Wall



Figure 20 Bulkhead Wall





Figure 21: Existing Utilities Along Outside of Trestle (Left)



Figure 22: Existing Utilities Along Outside of Trestle



Figure 23: Sign Bridge Prior to 2008 Paniting



Figure 24: Fire System



Figure 25: Fire Hydrant



Figure 26: Damaged Pavement



Figure 27: Removed Damage Decking



Figure 28: Existing Near Shore Trestle



Figure 29: Cap to Piling Fastener



Figure 30: Cap to Piling Fastner



Figure 31: Rotten Timber



Figure 32: Damaged/Rotten Outside Stringer

APPENDIX G

Excerpts from “Vashon Trestle Replacement Concept & Cost Analysis” Technical Memorandum



2407 North 31st Street, Suite 100
Tacoma, WA 98407
PH: 253-396-0150 FAX: 253-396-0162

4/25/2012
from WSF

MEMORANDUM

DRAFT

DATE: 4/4/2012

TO: Jeri Bernstein, SE, Washington State Ferries

FROM: Scott Kuebler, SE

SUBJECT: Vashon Trestle Replacement Concept & Cost Analysis

This memorandum summarizes work performed by KPFF for Washington State Ferries (WSF) per Agreement No. Y-10061, Task BC-00. The scope of work for this task involved performing preliminary structural analysis to develop concepts and estimated construction costs for replacement of the timber trestle at the Vashon Terminal. Refinement of construction costs previously developed by KPFF (under a separate task order) for seismic retrofit of the existing timber trestle was also included. It is our understanding that information provided to WSF as a result of this task will be considered in the capital improvement decision making process for the Vashon terminal. The following scope items were included in this task:

- Preliminary structural assessment of complete replacement of the trestle with a new concrete pile supported structure.
- Preliminary structural assessment of partial replacement of the trestle with a new concrete pile supported structure.
- Assessment of the constructability requirements for the proposed replacement options
- Development of an engineer's opinion of probable construction costs for structural components of the proposed replacement options
- Refinement of previously issued construction cost estimates for seismic retrofit of the existing trestle.

refurbishment
rehab

Structural engineering analysis associated with this task should be considered preliminary and only at a level of detail that is appropriate for developing planning-level construction cost estimates.

MEMORANDUM

REFERENCE MATERIAL

The following materials were referenced during performance of this task:

1. AASHTO LRFD Bridge Design Specifications, Fifth Edition, 2010
2. WSDOT Bridge Design Manual (LRFD), 2010
3. Precast/Prestressed Concrete Institute (PCI) Publication No. BM-20-04, *Precast Prestressed Concrete Piles*
4. WSF Contract Drawings for the Bainbridge Island Ferry Terminal Preservation Project (Contract #6995)
5. WSF Unit Cost Database Spreadsheet
6. Site specific geotechnical information provided by GeoEngineers

APPROACH TO STRUCTURAL ANALYSIS OF REPLACEMENT OPTIONS

Preliminary structural analysis was performed to develop site-specific concepts for trestle replacement that could then be used to estimate probable construction cost. The objective was to develop reliable planning-level construction cost estimates that can be used as part of WSF's budgeting process. A concept plan of the replacement trestle was provided by WSF and used as the basis for analysis (see **Figure 1**). Analysis consisted of evaluating the structural requirements for supporting seismic and gravity loads assuming a structural framing system consisting of a concrete pile substructure and a concrete superstructure. Deck span of the trestle superstructure was limited to 50 feet and 24-inch solid octagonal precast/prestressed concrete piling was assumed.

Approach to Seismic Analysis

A force-based approach (per AASHTO) was used to perform the preliminary seismic analysis of the trestle structure. The trestle was analyzed by performing a 2-dimensional, elastic, multi-modal dynamic analysis of the entire structure using a site-specific response spectrum prepared by GeoEngineers for the 975-year seismic event. This same spectrum was used for evaluating the performance of the existing trestle and that of the proposed retrofit concept. Through conversation with WSF, it was decided to use the 975-year event spectrum rather than the AASHTO 1,000-year event spectrum in order to develop an "apples-to-apples" comparison of construction costs between the replacement options and the previously developed retrofit option. Soil-structure interaction and the effects of liquefaction and lateral spreading were also considered, as was the load-sharing behavior of the concrete diaphragm.

MEMORANDUM

The seismic analysis was performed as follows:

1. A preliminary pile and pile cap layout plan was established that attempted to reduce the expected differential displacement between the off-shore and near-shore ends of the trestle. Pile cap spacing was initially set at approximately 50 feet on-center and piles were distributed along each pilecap based on mud-line elevation in an attempt to distribute stiffness somewhat uniformly along the length of the trestle (taller pile caps received more piles).
2. An LPILE analysis was performed for a typical pile to determine non-linear p-y spring data along the length of the embedded portion of the pile and to determine the pile embedment depth required to achieve fixity.
3. A 2-dimensional model of each pile bent was created using SAP2000 for the purpose of determining lateral stiffness. The models included cracked section properties for the piles ($I_{eff} = 0.5I_{gross}$), uncracked section properties of the pile caps, and non-linear p-y springs for lateral support of the piles below mud-line. Mud-line elevation at each bent was estimated from bathymetric survey information provided by WSF. Bent stiffness was determined by applying lateral load incrementally to the pile cap and recording associated displacement. The force-displacement relationship of the pile bent is non-linear due to the non-linear p-y soils springs supporting the piles. See **Figure 2** for a view of a typical 2-d bent model.
4. A 2-d model of the entire trestle was created to evaluate global behavior of the structure. A single frame element was used to model the "spine" of the structure, with stiffness properties that match those of a horizontal diaphragm provided by a 5-inch thick concrete topping slab. The spine element is supported by springs at each bent location (node) that represents the stiffness of the pile/pile cap frames in both the transverse and longitudinal directions (determined from Step 3). Masses were assigned to each node along the spine to represent the mass tributary to each pile bent. The weights of the piles, pilecaps, deck panels, topping slab, and the terminal building were included in the modeled mass. See **Figure 3** for a view of the 2-d spine model.
5. A dynamic analysis of the trestle was performed in both the longitudinal and transverse directions using the site specific response spectrum for the 975-year seismic event developed by GeoEngineers (see **Figure 4**). Reactions and displacements were recorded for each bent.
6. Recorded pilecap reactions from the dynamic analysis (Step 5) were then applied to each bent using the 2-d frame models developed in Step 3. Forces due to lateral spreading of the top 5-feet of soil were also applied to the piles (forces provided by GeoEngineers). To assess the demand on the structure, the bents were analyzed for the various combinations of dead, live, and seismic load prescribed in AASHTO, including consideration of the combination of seismic force effects acting along each of the principal axes of the structure (transverse and

MEMORANDUM

longitudinal). Pile performance was evaluated by comparing moment, axial, and shear demand on the piles to pile capacity. A Response Modification Factor, R of 3.5 was used to reduce the elastic demand on the piles as prescribed in AASHTO Table 3.10.7.1-1 for multiple column bents of an "essential" structure. P-delta effects were included in the analysis.

Moment and axial capacity of the piles was evaluated using PCI moment interaction diagrams for precast, prestressed concrete piles. Shear capacity was evaluated using recommendations provided by PCI.

7. The above process was repeated by adding and subtracting piles and pile caps to the trestle to achieve a reasonably balanced displacement response and acceptable demand-to-capacity ratios for the piling.

A displacement-based approach to seismic design that includes modeling of the inelastic behavior of the structure (pile hinging) should be considered for future analysis of the replacement trestle. Displacement-based analysis typically results in a more reliable estimate of damage for a given seismic hazard, and in some cases produces a more efficient design.

Approach to Gravity Analysis

Preliminary gravity analysis of the replacement trestle was performed using HL-93 vehicle live load requirements per AASHTO in combination with structure dead loads. Pile embedment requirements for gravity loading were determined using pile capacity curves provided by GeoEngineers (see **Figure 5**). Deck panel type and thickness was referenced from the Bainbridge Island Ferry Terminal Preservation project and checked via span tables located in the WSDOT Bridge Design manual. Pile cap dimensions were also referenced from the Bainbridge Island project.

SUMMARY OF COMPLETE REPLACEMENT OPTION

Structural Framing Concept

The structural framing concept for the option to completely replace the existing trestle is shown in **Figures 6 through 9**. The substructure consists of (18) pile caps supported by 193 concrete piles. Pile cap spacing varies from 26-feet to 50-feet on center, with required pile embedment below mud-line varying from 20 to 30-feet. Pile caps are cast-in-place concrete and deck panels consist of precast, prestressed voided slab girders with a 5-inch thick concrete topping. Precast deck panel thickness varies from 18 to 26 inches, depending on span. Irregular size deck areas are assumed to be constructed of 24-inch thick cast-in-place concrete. The bulkhead of the trestle consists of a cast-in-place concrete beam and cut-off wall supported by (7) driven steel HP piles.

MEMORANDUM

Constructability

To facilitate continued operation of the terminal during replacement of the trestle, at least one slip must remain open during the entire duration of construction. A phased construction schedule will be necessary to meet this requirement. **Figures 10 through 13** show one possible option for constructing the replacement trestle in (4) phases. This option for phasing allows at least one slip, as well as the terminal building, to remain operational throughout construction.

We anticipate that installation of the piles, pilecaps, and deck panels will occur via the use of barge-mounted cranes. Demolition and construction of the portion of the trestle closest to shore will be dependent on tides to ensure that sufficient draft is available for the barges (grounding of barges will most likely not be allowed). Another consideration is the availability of ready-mix concrete to the quality and quantity that will be required for construction of the pilecaps, irregular sections of deck, and the topping slab. If a suitable ready-mix concrete facility does not exist on the island, then concrete for the project will need to be delivered via ferry. Consideration of the logistical issues associated with concrete delivery must be included in the project planning and design process.

The available window to perform in-water work (timber pile removal and installation of the new piles) will be restricted to between approximately July 15 and February 15 to comply with environmental permit criteria. The requirement that the project be executed in phases to facilitate uninterrupted terminal operation will result in an overall construction schedule that extends into (2) in-water work seasons. Information regarding the anticipated duration of the major construction components of a 4-phase project is shown in **Figure 14**. Information contained in this planning-level construction schedule is intended to supplement the overall project schedule prepared by WSF.

Estimated Construction Cost

The estimated cost of construction of the structural components of the complete replacement option is \$16.5 million, or \$257 per square foot. A line-item summary of this estimate is shown in **Figure 15**. This estimate includes a 30% design contingency, but **does not** include sales tax, civil/mechanical/electrical components (drainage, striping, utilities, etc), temporary facilities, terminal building, sign bridges, permitting fees, consultant fees, WSF program costs, long-term maintenance costs, and other soft costs. Back-up data in support of the unit costs assumed for each of the items included in the estimate is also attached. The following sources were used to develop unit costs:

- WSF Terminal Engineering Unit Cost Database
- Manson Construction
- Quigg Bros Construction
- Concrete Technology Inc.
- WSDOT Bridge Design Manual
- WSDOT Bid Tabs Website

MEMORANDUM

- Bid tabs and schedule of values from the Port of Tacoma's *East Blair One Wharf (EBOW)* project and the Port of Tacoma's *Washington United Terminal (WUT)* wharf expansion project.

SUMMARY OF PARTIAL REPLACEMENT OPTION

Structural Framing Concept

The structural framing concept for the option to partially replace the existing trestle is shown in **Figures 16 through 18**. This concept consists of replacing only the north half of the narrow section of trestle that extends to the wider deck offshore. The wide deck area at the end of the trestle would be completely replaced. The remaining section of timber trestle would be seismically braced by the new concrete structure using steel ties and bracing. The structural framing concept for the new partial replacement trestle is similar to that developed for the complete replacement trestle. Additional concrete piling is required, however, to seismically brace the existing timber trestle that remains. This results in a slightly higher pile count on a square foot basis than for complete replacement.

Constructability

In order to facilitate continued operation of the terminal during construction, a phased construction approach will be necessary, similar to that described for the complete replacement option. **Figures 19 through 22** show one possible option for constructing the partial replacement concept in (4) phases. In comparison to the complete replacement concept, the partial replacement concept would require a shorter duration for the second phase of work, but would still most likely require that construction extend into (2) in-water work seasons. Also, all the challenges and constraints that are associated with complete replacement of the trestle must still be addressed with this partial replacement option.

Estimated Construction Cost

The estimated cost of construction of the structural components of the partial replacement option is \$12.7 million, or \$274 per square foot of replaced trestle. A line-item summary of this estimate is shown in **Figure 23**. This estimate includes a 30% design contingency. All of the exclusions mentioned above for the estimated cost of the complete replacement option also apply to the partial replacement option.

It is expected that the anticipated long-term maintenance cost of the partially replaced terminal will be higher than that of the complete replacement option due to continued maintenance of the existing timber trestle components that remain, as well as maintenance requirements (i.e., corrosion protection) of the new steel components installed to provide the seismic tie between the new and existing trestle.

MEMORANDUM

SUMMARY OF SEISMIC RETROFIT OPTION

Structural Framing Concept

As mentioned above, the option to seismically retrofit the existing timber trestle was explored under a separate task order. The concept consists of installing steel batter pile tri-pod frames along the perimeter of the trestle to provide lateral stability during a 975-year seismic event. The trestle would be tied to the tri-pod frames via a network of steel framing installed under the trestle deck. The basic concept is to provide the structure with a new seismic force resisting system rather than to continue to rely on the limited lateral capacity of the timber piles. Details of the retrofit concept are shown in **Figures 24 through 26**. The concept also includes installation of steel cradle beams along selected deteriorated timber pile caps to provide supplemental gravity support to the structure.

Constructability

Since the majority of construction work required to install the tri-pod system occurs outside or under the trestle, we expect that seismic retrofit of the trestle will have minimal impact on terminal operations. It is anticipated that lane closures will be required in order to provide a safe distance from work zones during pile driving and when material is being handled overhead. Installation of piling and heavy steel components will most likely occur via the use of barge mounted equipment. This work will be tide dependant, as will most of the work performed under the trestle deck. We anticipate that installation of steel components under the deck will occur either by working on floating skiffs, or on temporary fixed platforms attached to the new piling. It is anticipated that construction of the proposed retrofit concept can occur within (1) in-water work season.

Estimated Construction Cost

The estimated cost of construction of the seismic retrofit option is \$5 million, or \$81 per square foot of existing trestle. A line-item summary of this estimate is shown in **Figure 27**. This estimate includes a 30% design contingency. All of the exclusions mentioned above for the estimated cost of the complete replacement option also apply to the partial replacement option.

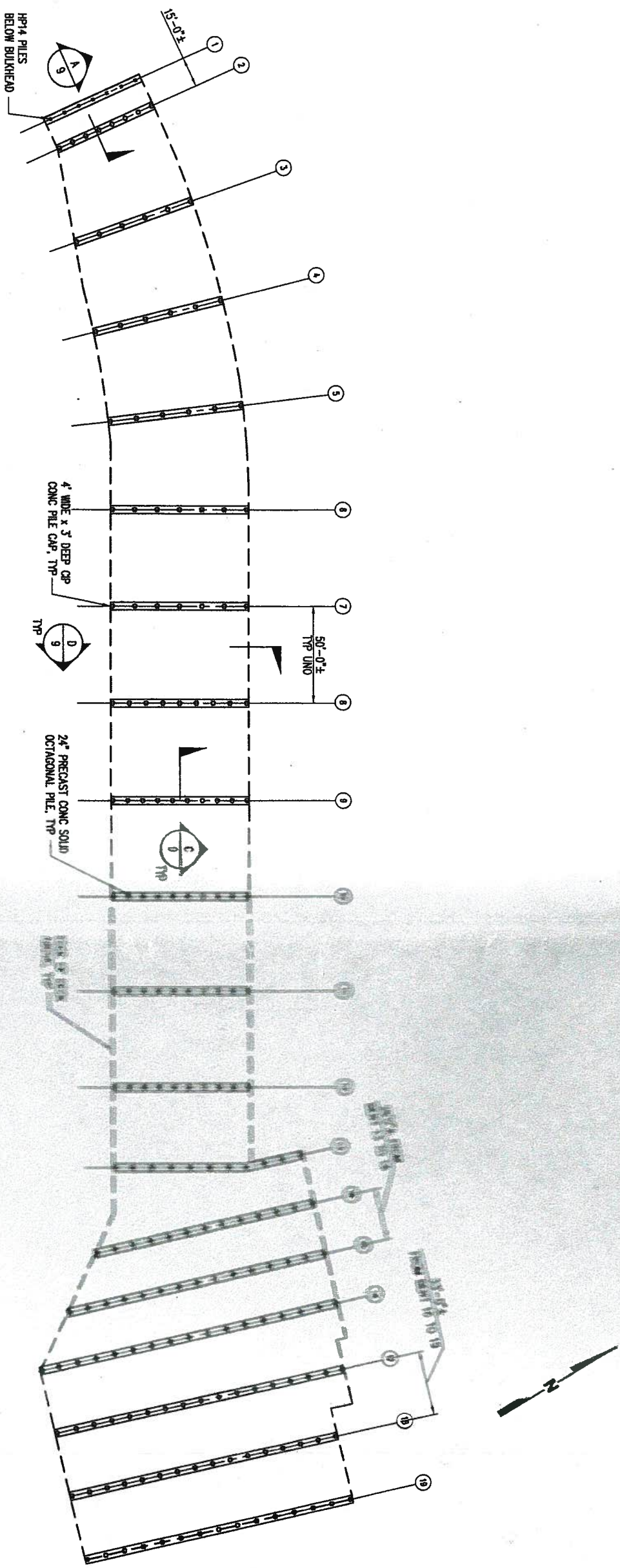
It is expected that the anticipated long-term maintenance cost of the retrofit option will be significantly higher than that of either the complete or partial replacement option due to continued maintenance of the existing timber trestle, as well as the maintenance requirements (i.e., corrosion protection) of the new steel components.

MEMORANDUM

SUMMARY TABLE

The following tables provide a comparison between the (3) options discussed above:

| Option | Estimated Construction Cost of Structural Components | Long-term Maintenance Considerations for Structure | Construction Phasing & Schedule |
|---|--|---|---|
| Complete Replacement with Concrete Trestle | \$16.5 million (\$257/sf) | Minor repairs to concrete | Multiple phases extending into (2) in-water work seasons required. |
| Partial Replacement with Concrete Trestle | \$12.7 million (\$274/sf) | More long-term maintenance considerations than complete replacement (minor repairs to concrete, corrosion protection maintenance of new steel components, continued maintenance of timber structure that remains) | Multiple phases extending into (2) in-water work seasons required. Shorter overall duration than complete replacement option. |
| Seismic Retrofit = <i>Rehabilitation</i> | \$5 million (\$81/sf) | Significantly higher long-term maintenance considerations than either complete or partial replacement (corrosion protection maintenance of new steel components, continued maintenance of most of the timber structure) | Single phase in (1) in-water work season. |



VASHON TRESTLE PILE & PILECAP PLAN
PRELIMINARY CONCEPT FOR COMPLETE REPLACEMENT

TO BE USED FOR BUDGET LEVEL COST ESTIMATING ONLY

| VASHON FERRY TERMINAL PRELIMINARY CONCEPT FOR REPLACEMENT | |
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| PILE/PILECAP PLAN | |

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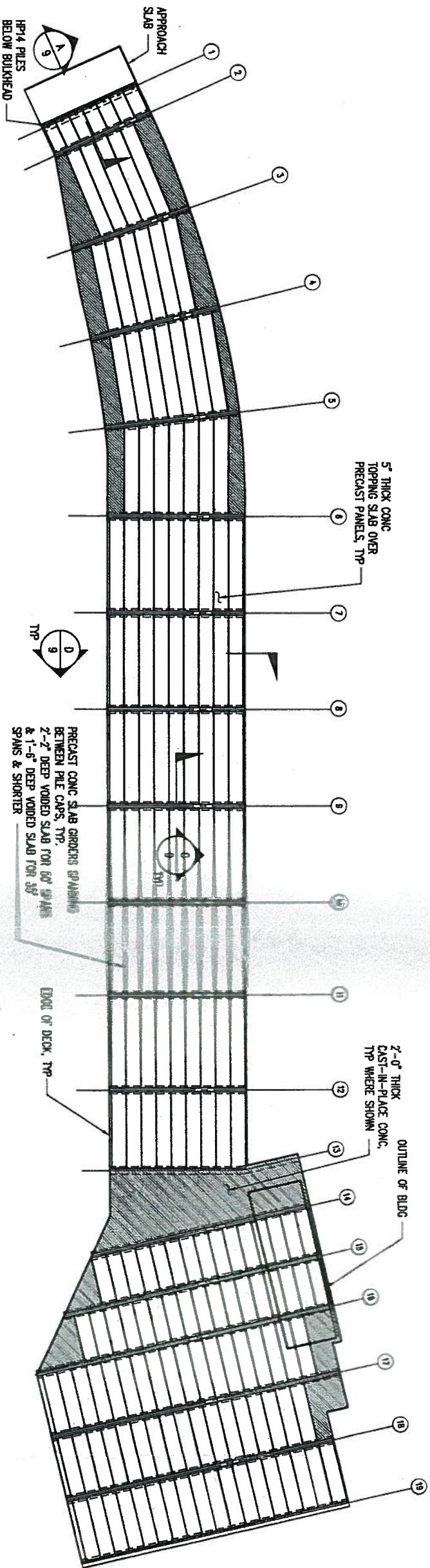
PROJECT NO.: 112024

SCALE: NTS

DATE: 3/16/12

SHEET NO.

FIGURE 6



VASHON TRESTLE DECK PLAN
PRELIMINARY CONCEPT FOR COMPLETE REPLACEMENT

TO BE USED FOR BUDGET LEVEL COST ESTIMATING ONLY

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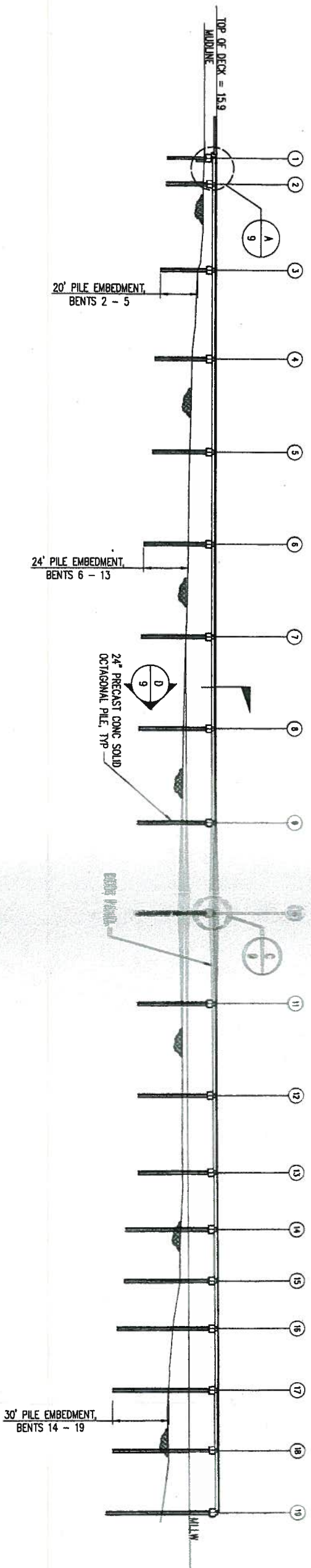
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VASHON FERRY TERMINAL
PRELIMINARY CONCEPT FOR REPLACEMENT

DECK PLAN

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VASHON TRESTLE SECTION
PRELIMINARY CONCEPT FOR COMPLETE REPLACEMENT

TO BE USED FOR BUDGET LEVEL COST ESTIMATING ONLY

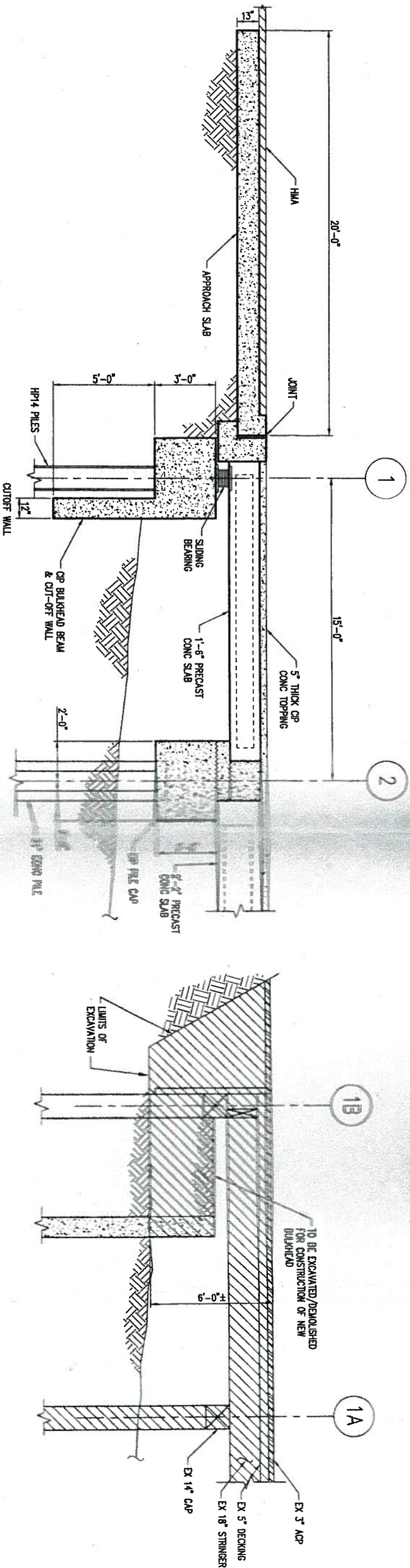
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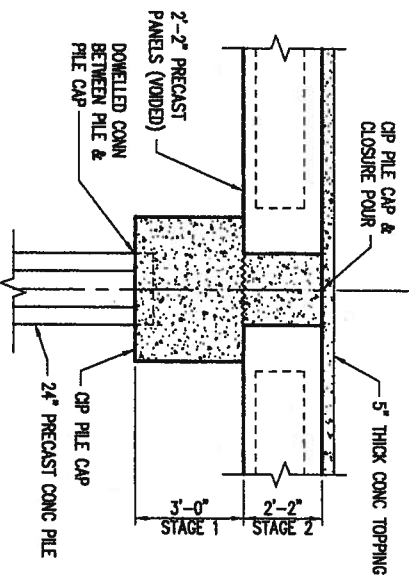
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FIGURE 8

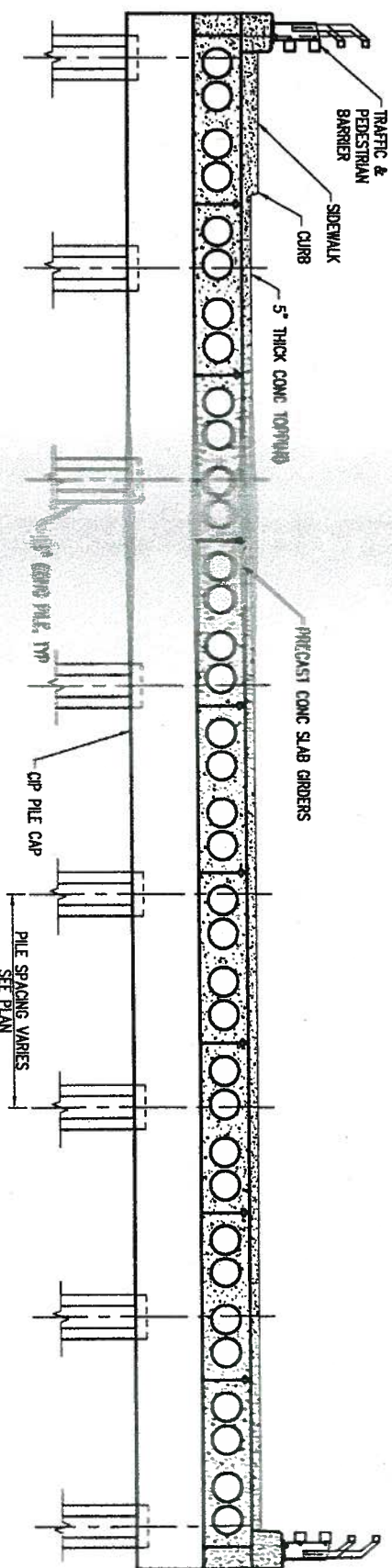


BULKHEAD SECTION
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EXISTING BULKHEAD SECTION
SCALE: 3/8"=1'-0"



TYPICAL PILECAP SECTION
SCALE: 3/8"=1'-0"



TYPICAL TRANSVERSE SECTION
SCALE: 3/8"=1'-0"

TO BE USED FOR BUDGET LEVEL COST ESTIMATING ONLY

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VASHON FERRY TERMINAL
PRELIMINARY CONCEPT FOR REPLACEMENT

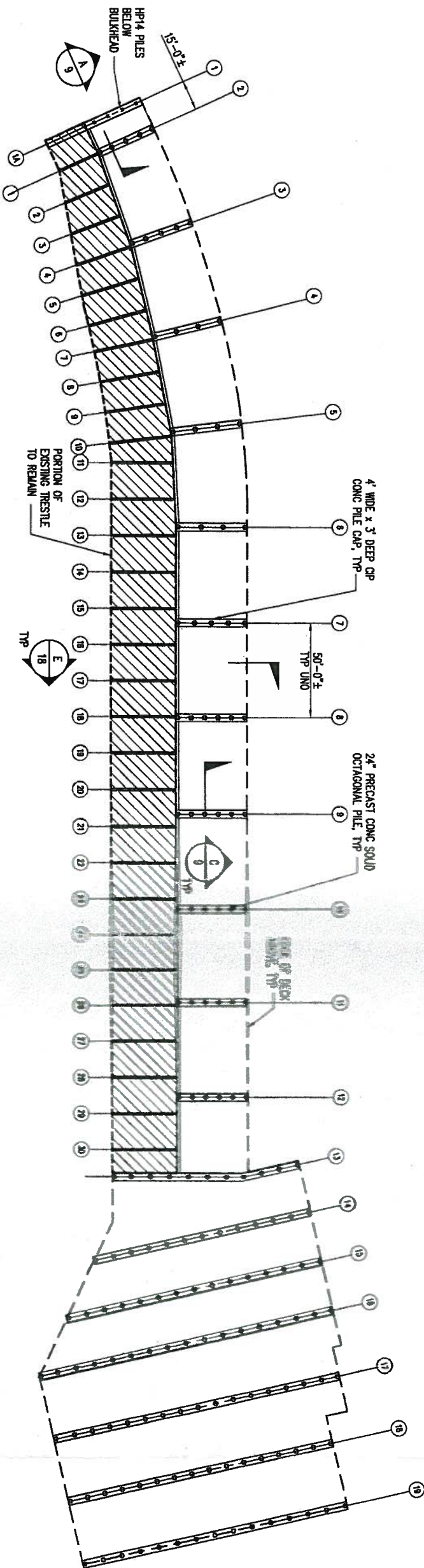
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FIGURE

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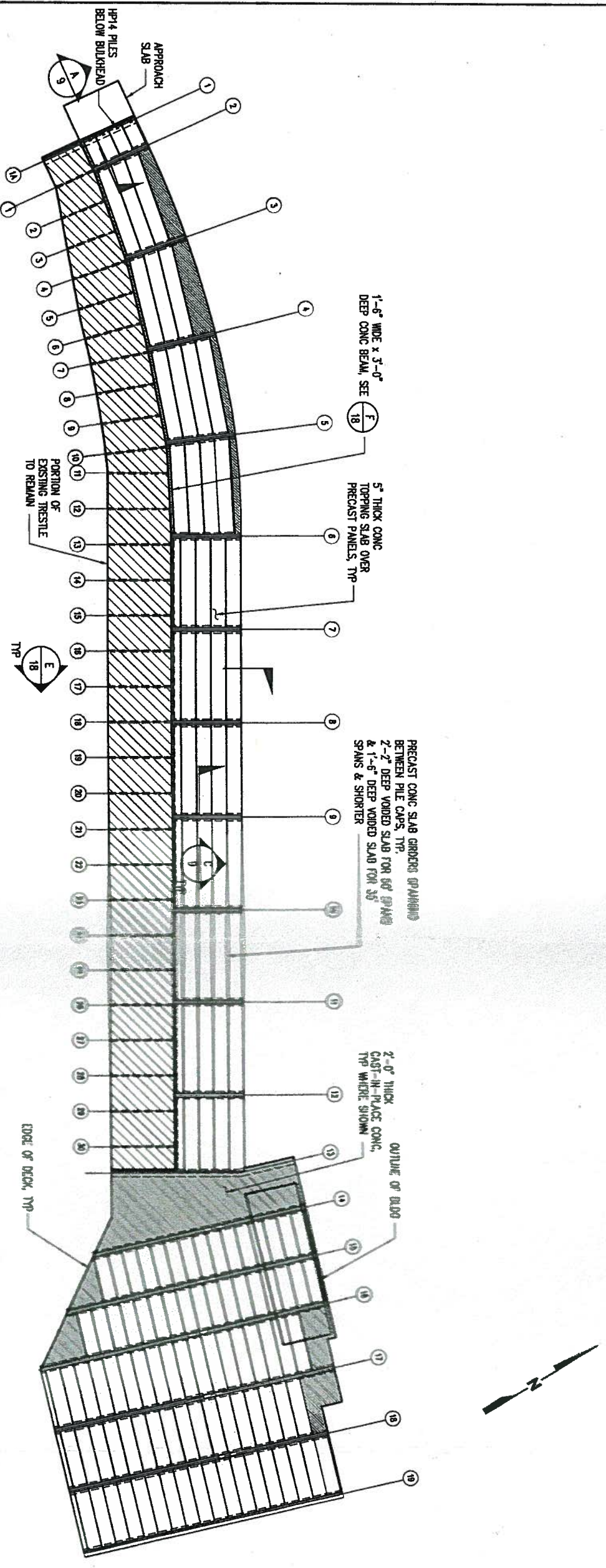


VASHON TRESTLE PILE & PILECAP PLAN
PRELIMINARY CONCEPT FOR PARTIAL REPLACEMENT

TO BE USED FOR BUDGET LEVEL COST ESTIMATING ONLY

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| VASHON FERRY TERMINAL PRELIMINARY CONCEPT FOR PARTIAL REPLACEMENT | | PILE/PILECAP PLAN | |
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VASHON TRESTLE DECK PLAN
PRELIMINARY CONCEPT FOR PARTIAL REPLACEMENT

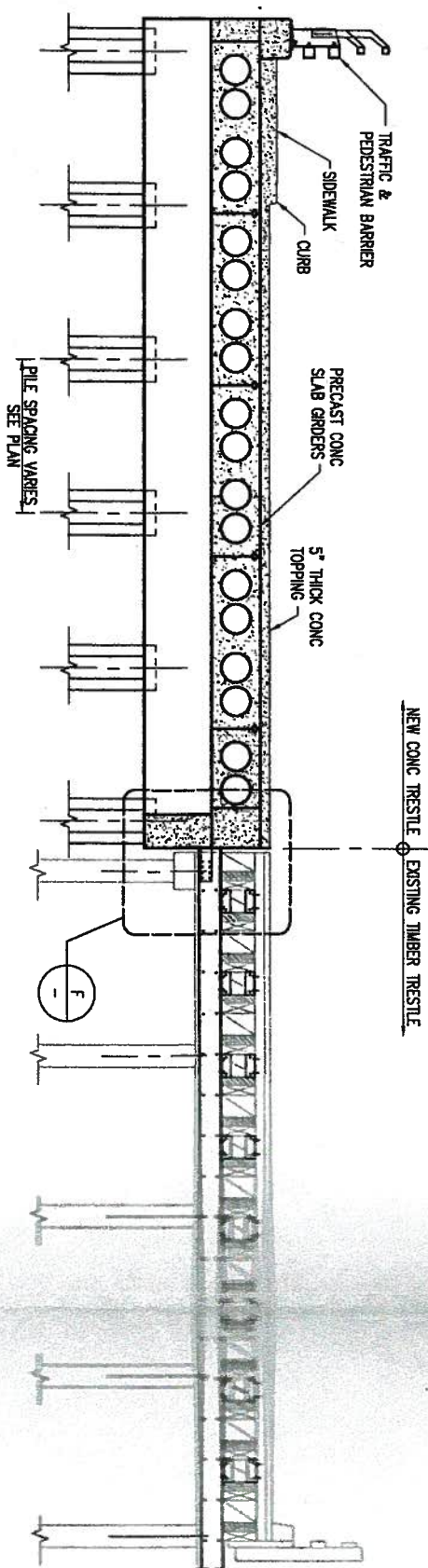
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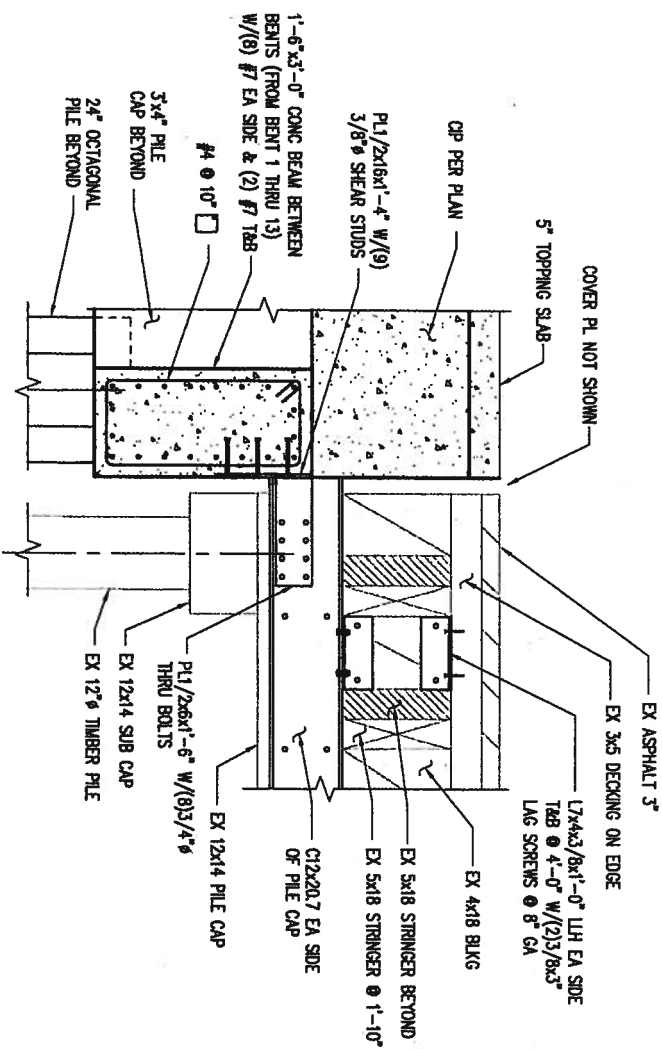
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| VASHON FERRY TERMINAL PRELIMINARY CONCEPT FOR PARTIAL REPLACEMENT | DECK PLAN |
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TYPICAL TRANSVERSE SECTION
PARTIAL REPLACEMENT
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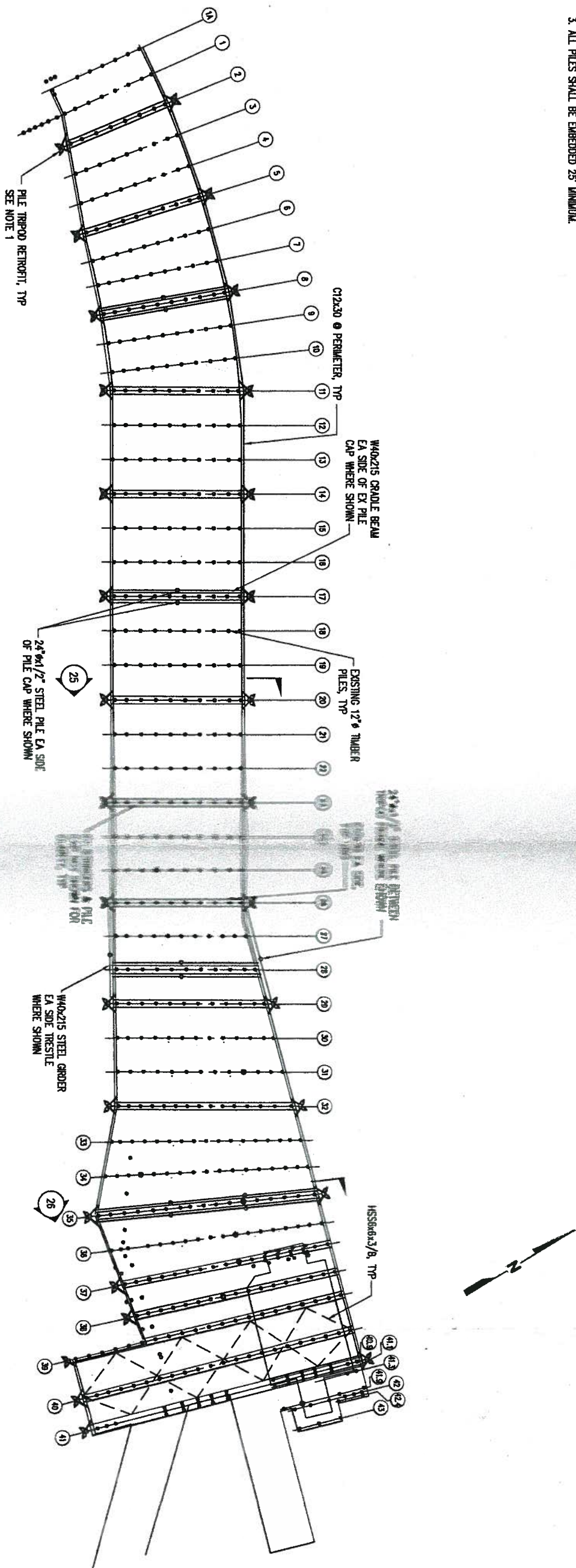


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- GENERAL NOTES:
1. INDICATES TYPICAL PILE TRIPOD RETROFIT.
 2. TYPICAL BATTER PILE TRIPOD ASSEMBLIES.
- GEOTECHNICAL ZONE 1:
- 24" 6x1/2" BATTER PILE
- 36" 6x1/2" PLUMB PILE
- GEOTECHNICAL ZONE 2:
- 36" 6x1/2" BATTER PILE
- 36" 6x1/2" PLUMB PILE
3. ALL PILES SHALL BE EMBEDDED 25' MINIMUM.

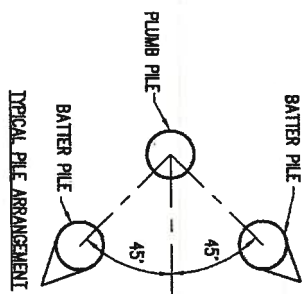


1 VASHON TERMINAL RETROFIT PLAN

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VASHON FERRY
TERMINAL

RETROFIT
PLAN



SECTION 1

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VASHON FERRY
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RETROFIT SECTION

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VASHON TERMINAL RETROFIT

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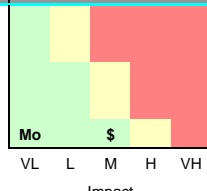
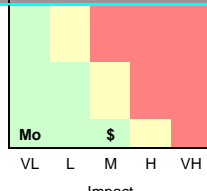
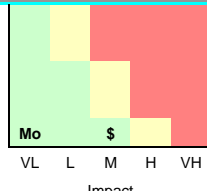
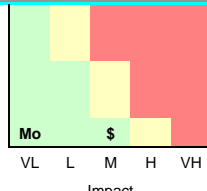
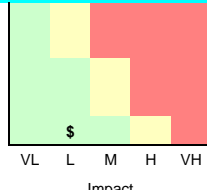
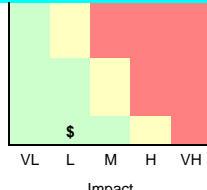
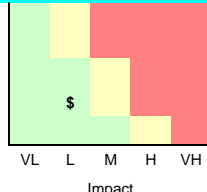
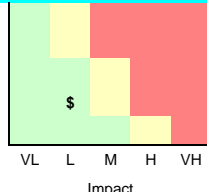
VASHON FERRY TERMINAL

RETROFIT SECTION


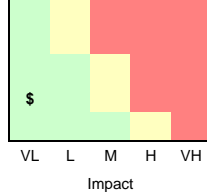
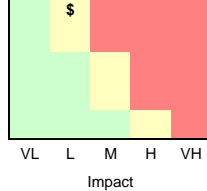
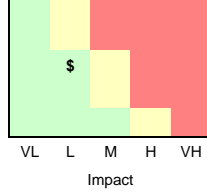
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APPENDIX H


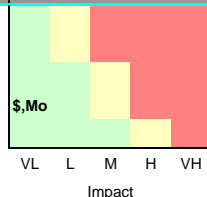
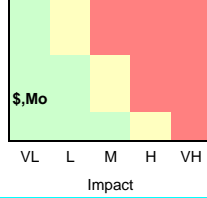
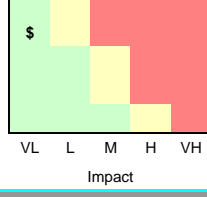
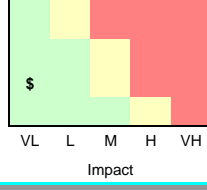
Risk Matrix

| Project Title | | Vashon Trestle Preservation (Replacement): Alt 2A Seismic | | | | | Value | | Variability | | Risk Markups | | WSDOT Escalation tables built-in. | | % | Total Cost CY [\$M] | Total Cost YOY [\$M] | | Ad Date | |  | End Construction date | | WSDOT Ovidiu Cretu 360-705-7599 | | | |
|--|--------|---|------------------|--|--|--------------------------|-------------------|-------------------------|-------------------------|-----------------------|-----------------------|-----------------|-----------------------------------|--|---|---------------------|---|---------------------------|------------|---|--|------------------------|---------------------------|---------------------------------|----------------|--|--|
| Estimate Date | | 06/21/12 | | | | | Target AD date | | 04/14/14 | | 10% | | Mob | | 10.0% | | A/B/A Duration | | 50 | 11.35 | | 13.69 | | | | | |
| Project PIN # | | The above macro should be activated to generate the final results. Do not stop it if it is running. | | | Estimated CN Duration | | 252.0Mo | | 10% | | Tax | | 8.6% | | on-WSDOT rate | | YOY | 60 | 11.54 | | 13.91 | | | | | | |
| Last Review Date | | | | | 06/21/12 | | Estimated PE Cost | | 3.22 \$M | | 10% | | CE | | 11.0% | | PE | | | 3.3\$M | 70 | 11.72 | | | 14.16 | | |
| Project Manager | | | | | Charlie Torres | | | Estimated ROW Cost | | | | 10% | | PE | | 9.1% | | ROW | | | 0.0\$M | 80 | 11.93 | | 14.42 | | |
| | | | | | | | Estimated CN Cost | | 7.90 \$M | | 10% | | C.O.C | | 4.0% | | CN | | | 10.2\$M | 90 | 12.21 | | | 14.77 | | |
| The yellow highlighted cells have to be filled in order for macro to run correctly. The light green highlighted cells may be filled if you know what you are doing. !!!!!!! Existing (Pre-Mitigated) Design!!!!!!!!!!!!Created and Maintained by WSDOT, contact Ovidiu Cretu 360-705-7599, cretuo@wsdot.wa.gov | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Risk Identification | | | | | | | | | | Quantitative Analysis | | | | Qualitative Display of the Best Guess Impact | | | | Risk Response Plan | | | | Monitoring and Control | | | Critical Issue | | |
| Risk # | Status | Dependency | Project Phase | Summary Description Threat and/or Opportunity | Detailed Description of Risk Event (Specific, Measurable, Attributable, Relevant, Timebound) [SMART] | Risk Trigger | Type | Probability/Correlation | Risk Impact (\$M or Mo) | | Expected Impact (\$M) | Probability (%) | Impact | Risk Matrix (Probability of Occurrence by Expected Impact) | | Strategy | ACTION TO BE TAKEN Response Actions including advantages and disadvantages include date | | Risk Owner | Risk Review Dates | Date, Status and Review Comments (Do not delete prior comments, therefore providing a history) | | Is Risk on Critical Path? | | | | |
| (1) | (2) | (3) | (5) | (6) | (7) | (8) | (9) | (10) | [10a] | (11) | (12) | (13) | (14) | (15) | | (16) | (17) | | (18) | (19) | (20) | | (21) | | | | |
| 1 | Active | | Pre-construction | Threat | The refurbishment alternative leaves creosote timbers in place for as many as 25 more years, increases over water coverage slightly, and increases benthic coverage. | Selection of alternative | Cost | 15% | MIN | 0.10\$M | 0.03\$M | Very Low | Moderate | Probability |  | Mitigation | Meet with the Tribes, invite Management, propose mitigation. Develop plan to remove creosote treated timbers in the future (give specific dates if possible), and plan to mitigate for additional overwater coverage. | Philip Narte | 6/16/2012 | 4/24/12: Phillip Narte emails Puyallup Tribe requesting an update meeting. 5/24/12: Meet w/ Phillip Narte and Puyallup Tribe in Fife to provide project update. | YES | | | | | | |
| | | | | Tribes oppose Army Corps Permit | | | | | MAX | 0.30\$M | | | | | | | | | | | | | | | | | |
| | | | | | | | | | Master Duration Risk | | | | | | | | | | | | | | | | | | |
| | | | | | | | Schedule | | MIN | 3.0Mo | 0.9Mo | Very Low | Very Low | Probability |  | | | | | | | | | | | | |
| | | | | | | | | | MAX | 9.0Mo | | | | | | | | | | | | | | | | | |
| | | | Most Likely | 6.0Mo | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Active | | Pre-construction | Threat | Mitigation will be required for additional overwater coverage, benthic impact. Inconsistent with A Report From The Indian Treaty Tribes In Western Washington: Treaty Rights At Risk, July 14, 2011. | Selection of alternative | Cost | 15% | MIN | 0.05\$M | 0.04\$M | Very Low | Moderate | Probability |  | Mitigation | Discuss mitigation strategy with TE Management. Plan to mitigate or revise chosen alternative. | Rick Huey | 6/15/2012 | Rick Huey to reach out / partner with NOAA to try get a feel for what they want, how they see the alternative. | YES | | | | | | |
| | | | | NOAA opposes the project | | | | | MAX | 0.50\$M | | | | | | | | | | | | | | | | | |
| | | | | | | | | | 0 | | | | | | | | | | | | | | | | | | |
| | | | | | | | Schedule | | MIN | 3.0Mo | 1.0Mo | Very Low | Very Low | Probability |  | | | | | | | | | | | | |
| | | | | | | | | | MAX | 12.0Mo | | | | | | | | | | | | | | | | | |
| | | | Most Likely | 6.0Mo | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Active | | Pre-construction | Threat | Accepting Federal Funds will force us to address ADA and stormwater treatment issues. 2 alternatives do not address salmon recovery issues. | Selection of alternative | Cost | 15% | MIN | 0.05\$M | 0.02\$M | Very Low | Low | Probability |  | Acceptance | Assuming we chose the alternatives that don't meet ADA and stormwater treatment requirements, revise design to include some ADA and stormwater improvements. Widening the trestle to include a wider pedestrian walkway and trigger relocating utilities and/or increasing the trestle footprint which would trigger additional mitigation. | Steve Levengood | 6/15/2012 | PM to work with Steve Levengood and Ed Barry to come up with an acceptable plan for ADA | YES | | | | | | |
| | | | | Federal Funds require additional environmental considerations. | | | | | MAX | 0.20\$M | | | | | | | | | | | | | | | | | |
| | | | | | | | | | Master Duration Risk | | | | | | | | | | | | | | | | | | |
| | | | | | | | Schedule | | MIN | | 0.0Mo | Very Low | Insignificant | Probability |  | | | | | | | | | | | | |
| | | | | | | | | | MAX | | | | | | | | | | | | | | | | | | |
| | | | Most Likely | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Active | | Pre-construction | Threat | In the eyes of some in the community, 2 alternatives appear to ignore the potential impacts on residents should an earthquake hit. The community opposition movement is well organized and vocal. | Selection of alternative | Cost | 25% | MIN | 0.05\$M | 0.03\$M | Low | Low | Probability |  | | Tell the community the truth, we don't have the money for the alternative they want. They'll have to continue living with the risk. | David Mosely/Marta Corsey | 6/15/2012 | Customer Outreach/Communicaitons to assist | YES | | | | | | |
| | | | | Vashon Residents oppose Reburishment alternative | | | | | MAX | 0.15\$M | | | | | | | | | | | | | | | | | |
| | | | | | | | | | Most Likely | 0.10\$M | | | | | | | | | | | | | | | | | |
| | | | | | | | Schedule | | 0 | | 0.0Mo | Low | Insignificant | Probability |  | | | | | | | | | | | | |
| | | | | | | | | | MIN | | | | | | | | | | | | | | | | | | |
| | | | Most Likely | | | | | | | | | | | | | | | | | | | | | | | | |


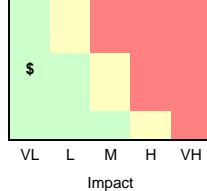
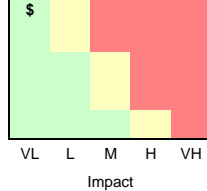
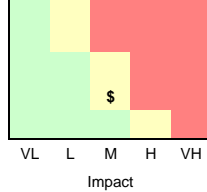
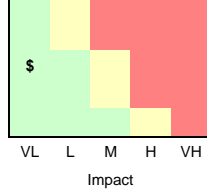
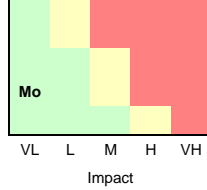
Alternative 2A: Seismic Bracing

| Project Title | | Vashon Trestle Preservation (Replacement): Alt 2A Seismic | | | | | Value | | Variability | | Risk Markups | | WSDOT Escalation tables built-in. | | % | Total Cost CY [\$M] | Total Cost YOY [\$M] | Ad Date | |  | End Construction date | | WSDOT Ovidiu Cretu 360-705-7599 | | | | | | |
|---|---------|---|------------------|---|--|---|---|-------------------------|-------------------------|-----------------------|-----------------------|-----------------|-----------------------------------|--|--|---|---|----------------|------------|--|--|------------------|---------------------------------|---|---|--|------------------|-----|-----|
| Estimate Date | | 06/21/12 | | | | | Target AD date | | 04/14/14 | | 10% | | Mob | | 10.0% | | A/B/A Duration | | 50 | May 4, 2014 | | 50% | | June 16, 2035 | | | | | |
| Project PIN # | | | | | The above macro should be activated to generate the final results. Do not stop it if it is running. | | | Estimated CN Duration | | 252.0Mo | | 10% | | Tax | | 8.6% | | on-WSDOT rate | | YOY | May 18, 2014 | | 60% | | September 8, 2035 | | | | |
| Last Review Date | | 06/21/12 | | Estimated PE Cost | | | | 3.22 \$M | | 10% | | CE | | 11.0% | | PE | | | | 3.3\$M | | 70 | June 24, 2014 | | 70% | | December 4, 2035 | | |
| Project Manager | | Charlie Torres | | Estimated ROW Cost | | | | | | 10% | | PE | | 9.1% | | ROW | | | | 0.0\$M | | 80 | August 19, 2014 | | 80% | | March 17, 2036 | | |
| | | | | Estimated CN Cost | | | | 7.90 \$M | | 10% | | C.O.C | | 4.0% | | CN | | | | 10.2\$M | | 90 | October 3, 2014 | | 90% | | July 31, 2036 | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| The yellow highlighted cells have to be filled in order for macro to run correctly. The light green highlighted cells may be filled if you know what you are doing. !!!!!!! Existing (Pre-Mitigated) Design!!!!!!!!!!!!Created and Maintained by WSDOT, contact Ovidiu Cretu 360-705-7599, ccretuo@wsdot.wa.gov | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Risk Identification | | | | | | | | | | Quantitative Analysis | | | | | Qualitative Display of the Best Guess Impact | | | | | Risk Response Plan | | | Monitoring and Control | | | Critical Issue | | | |
| Risk # | Status | Dependency | Project Phase | Summary Description Threat and/or Opportunity | Detailed Description of Risk Event (Specific, Measurable, Attributable, Relevant, Timebound) [SMART] | Risk Trigger | Type | Probability/Correlation | Risk Impact (\$M or Mo) | | Expected Impact (\$M) | Probability (%) | Impact | Risk Matrix (Probability of Occurrence by Expected Impact) | | Strategy | ACTION TO BE TAKEN Response Actions including advantages and disadvantages include date | | Risk Owner | Risk Review Dates | Date, Status and Review Comments (Do not delete prior comments, therefore providing a history) | | Is Risk on Critical Path? | | | | | | |
| (1) | (2) | (3) | (5) | (6) | (7) | (8) | (9) | (10) | [10a] | (11) | (12) | (13) | (14) | (15) | | (16) | (17) | | (18) | (19) | (20) | | (21) | | | | | | |
| 5 | Active | | Pre-construction | Threat | Insufficient funds | Project alternative is not fully funded | 30% estimate comes in higher than budget | Cost | 25% | MIN | 0.01\$M | 0.01\$M | Low | Very Low | Probability |  | Plan to scale back project; revise design. | Charlie Torres | 6/15/2012 | Track estimates. Work with Steve Levensgood and discipline leads to develop a more thorough estimate. If we still have insufficient funds, cut scope (don't replace seawall or terminal building?) | YES | | | | | | | | |
| | | | | MAX | | | | | | 0.05\$M | | | | | | | | | | | | | | | | | | | |
| | | | | Most Likely | | | | | | 0.03\$M | | | | | | | | | | | | | | | | | | | |
| | | | | Master Duration Risk | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | Schedule | | | | | | 0 | MIN | | | | | | | | | | | | MAX | | Most Likely | | | | |
| 6 | Active | | Pre-construction | Threat | Selection of Rehabilitation alternative makes it difficult/impossible to implement lane & sidewalk width standards | Recently adapted standards are more difficult and costly to apply. Not doing so results in long term impacts to Operations. | Selection of alternative | Cost | 90% | MIN | 0.05\$M | 0.11\$M | Very High | Low | Probability |  | Work with various agencies and ASDE to develop a plan to satisfy them. May result if follow up mini-projects | Charlie Torres | 6/15/2012 | Reach out to those who have an interest in meeting standards (Operations, ASDE) and talk to them about the project alternative to see if we can find common ground to gain their support | YES | | | | | | | | |
| | | | | MAX | | | | | | 0.25\$M | | | | | | | | | | | | | | | | | | | |
| | | | | Most Likely | | | | | | 0.10\$M | | | | | | | | | | | | | | | | | | | |
| | | | | 0 | | | | | | | MIN | | | | | | | | | | | | MAX | | Most Likely | | | | |
| | | | | 7 | | | | | | Active | | | | | | | | | | | | Pre-construction | Threat | Project does not go to Construction due to opposition | Alternative Selection does not get permitted. Design Team Spends \$3.2M PE budget and has to start all over as project is canceled | Army Corps and/or NOAA notify environmental staff that permit may NOT be forthcoming | Cost | 15% | MIN |
| MAX | 3.20\$M | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Most Likely | 1.60\$M | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Master Duration Risk | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Schedule | 0 | MIN | | | MAX | | Most Likely | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Active | | Pre-construction | Threat | ESA/MMPA triggers compliance NEW issues that could impact schedule for construction | Compliance with ESA will require a biological evaluation of the existing habitat and species potentially impacted by the project during and after construction. Marbled Murrelet have impacted pile driving on other projects requiring Contractors to stop work. What about the Giant Plumose Anemone? Also impacts negotiations with tribe for permits. | Environmental process during pre-design will provide direction for design and special provisions during construction. | Cost | 50% | MIN | 0.05\$M | 0.08\$M | Moderate | Low | Probability |  | Following field investigations by biologists, use any lessons learned from past projects and and/or develop special provisions to include in the contract as part of permit approval process. | | | | YES | | | | | | | | |
| | | | | MAX | | | | | | 0.25\$M | | | | | | | | | | | | | | | | | | | |
| | | | | Most Likely | | | | | | 0.15\$M | | | | | | | | | | | | | | | | | | | |
| | | | | 0 | | | | | | | MIN | | | | | | | | | | | | MAX | | Most Likely | | | | |
| | | | | 9 | | | | | | Active | | | | | | | | | | | | Pre-construction | Threat | Inconsistent with the Puget Sound (Clean Up) Initiative | The Governor has a goal of cleaning up toxic chemicals, restoring waterways and salmon habitat, in the Puget Sound in the next 20 years. The refurbishment alternative does not address this issue. | Management asks us to implement an alternative inconsistent with the initiative | Cost | 10% | MIN |
| MAX | 0.03\$M | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Most Likely | 0.02\$M | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Master Duration Risk | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Schedule | 0 | MIN | 1.0Mo | | MAX | 6.0Mo | Most Likely | 3.0Mo | | | | | | | | | | | | | | | | | | | | | |

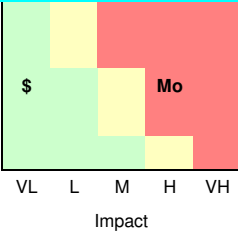
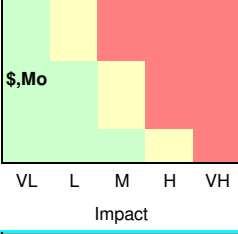
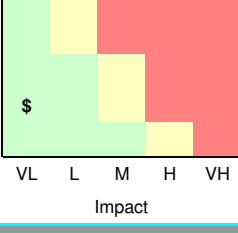
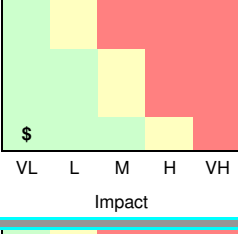
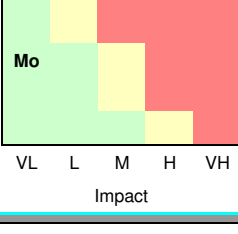
Alternative 2A: Seismic Bracing

| Project Title | | Vashon Trestle Preservation (Alt 2B): Refurbishment | | | | | Value | | Variability | | Risk Markups | | WSDOT Escalation tables built-in. | | % | Total Cost CY [\$M] | Total Cost YOE [\$M] | | Ad Date | |  | End Construction date | | WSDOT Ovidiu Cretu 360-705-7599 | | | |
|---|--------|---|------------------|---|--|--------------------------|-------------------|-------------------------|-------------------------|----------|-----------------------|--|-----------------------------------|--|---|---------------------|---|---------------------------|------------|---|--|-----------------------|---------------------------|---------------------------------|-------|--|--|
| Estimate Date | | 06/21/12 | | | | | Target AD date | | 04/14/14 | | 10% | | Mob | | 10.0% | | V/B/A Duration | | 50 | 46.53 | | 59.02 | | | | | |
| Project PIN # | | The above macro should be activated to generate the final results. Do not stop it if it is running. | | | Estimated CN Duration | | | 252.0Mo | | 10% | | Tax | | 8.6% | | on-WSDOT rate | | YOE | 60 | 47.47 | | 60.20 | | | | | |
| Last Review Date | | | | | 06/21/12 | | Estimated PE Cost | | | 3.22 \$M | | 10% | | CE | | 11.0% | | PE | | 3.3\$M | 70 | 48.39 | | | 61.41 | | |
| Project Manager | | | | | Charlie Torres | | | Estimated ROW Cost | | | | | 10% | | PE | | 9.1% | | ROW | | 0.0\$M | 80 | 49.48 | | 62.79 | | |
| | | | | | | | | Estimated CN Cost | | | 43.00 \$M | | 10% | | C.O.C | | 4.0% | | CN | | 55.3\$M | 90 | 50.92 | | 64.65 | | |
| The yellow highlighted cells have to be filled in order for macro to run correctly. The light green highlighted cells may be filled if you know what you are doing. !!!!!!! Existing (Pre-Mitigated) Design!!!!!!!!!!!!Created and Maintained by WSDOT, contact Ovidiu Cretu 360-705-7599, ccretuo@wsdot.wa.gov | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Risk Identification | | | | | Quantitative Analysis | | | | | | | Qualitative Display of the Best Guess Impact | | | | | Risk Response Plan | | | Monitoring and Control | | Critical Issue | | | | | |
| Risk # | Status | Dependency | Project Phase | Summary Description Threat and/or Opportunity | Detailed Description of Risk Event (Specific, Measurable, Attributable, Relevant, Timebound) [SMART] | Risk Trigger | Type | Probability/Correlation | Risk Impact (\$M or Mo) | | Expected Impact (\$M) | Probability (%) | Impact | Risk Matrix (Probability of Occurrence by Expected Impact) | | Strategy | ACTION TO BE TAKEN Response Actions including advantages and disadvantages include date | | Risk Owner | Risk Review Dates | Date, Status and Review Comments (Do not delete prior comments, therefore providing a history) | | Is Risk on Critical Path? | | | | |
| (1) | (2) | (3) | (5) | (6) | (7) | (8) | (9) | (10) | [10a] | (11) | (12) | (13) | (14) | (15) | | (16) | (17) | | (18) | (19) | (20) | | (21) | | | | |
| 1 | Active | | Pre-construction | Threat | The refurbishment alternative leaves creosote timbers in place for as many as 25 more years, increases over water coverage slightly, and increases benthic coverage. It also requires the Tribes to assist in 5 separate projects verses 1 or 2. | Selection of alternative | Cost | 25% | MIN | 0.10\$M | 0.05\$M | Low | Very Low | Probability |  | Mitigation | Meet with the Tribes, invite Management, propose mitigation. Develop plan to remove creosote treated timbers in the future (give specific dates if possible), and plan to treat surface water and mitigate for additional overwater coverage. | Philip Narte | 6/16/2012 | 4/24/12: Phillip Narte emails Puyallup Tribe requesting an update meeting. 5/24/12: Meet w/ Phillip Narte and Puyallup Tribe in Fife to provide project update. | YES | | | | | | |
| | | | | MAX | | | | | 0.30\$M | | | | | | | | | | | | | | | | | | |
| | | | | Most Likely | | | | | 0.20\$M | | | | | | | | | | | | | | | | | | |
| | | | | Master Duration Risk | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 0 | | | | | | MIN | | | | | | | | | | | | 3.0Mo | 1.5Mo | Very Low | | | |
| MAX | 9.0Mo | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Most Likely | 6.0Mo | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Schedule | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Active | | Pre-construction | Threat | Mitigation will be required for additional overwater coverage, benthic impact. Inconsistent with A Report From The Indian Treaty Tribes In Western Washington: Treaty Rights At Risk, July 14, 2011. | Selection of alternative | Cost | 25% | MIN | 0.05\$M | 0.06\$M | Low | Very Low | Probability |  | Mitigation | Discuss mitigation strategy with TE Management. Plan to mitigate or revise chosen alternative. | Rick Huey | 6/15/2012 | Rick Huey to reach out / partner with NOAA to try get a feel for what they want, how they see the alternative. | YES | | | | | | |
| | | | | MAX | | | | | 0.50\$M | | | | | | | | | | | | | | | | | | |
| | | | | Most Likely | | | | | 0.25\$M | | | | | | | | | | | | | | | | | | |
| | | | | 0 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 2 | | | | | | MIN | | | | | | | | | | | | 3.0Mo | 1.6Mo | Very Low | | | |
| MAX | 12.0Mo | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Most Likely | 6.0Mo | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Schedule | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Active | | Pre-construction | Threat | Accepting Federal Funds will force us to address ADA and stormwater treatment issues. 2 alternatives do not address salmon recovery issues. | Selection of alternative | Cost | 75% | MIN | 0.05\$M | 0.08\$M | High | Very Low | Probability |  | Acceptance | Assuming we chose the alternatives that don't meet ADA and stormwater treatment requirements, revise design to include some ADA and stormwater improvements. Widening the trestle to include a wider pedestrian walkway and trigger relocating utilities and/or increasing the trestle footprint which would trigger additional mitigation. | Steve Levensgood | 6/15/2012 | PM to work with Steve Levensgood and Ed Barry to come up with an acceptable plan for ADA | YES | | | | | | |
| | | | | MAX | | | | | 0.20\$M | | | | | | | | | | | | | | | | | | |
| | | | | Most Likely | | | | | 0.10\$M | | | | | | | | | | | | | | | | | | |
| | | | | Master Duration Risk | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 0 | | | | | | MIN | | | | | | | | | | | | | 0.0Mo | Insignificant | | | |
| MAX | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Most Likely | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Schedule | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Active | | Pre-construction | Threat | In the eyes of some in the community, 2 alternatives appear to ignore the potential impacts on residents should an earthquake hit. The community opposition movement is well organized and vocal. | Selection of alternative | Cost | 25% | MIN | 0.05\$M | 0.03\$M | Low | Very Low | Probability |  | | Tell the community the truth, we don't have the money for the alternative they want. They'll have to continue living with the risk. | David Mosely/Marta Corsey | 6/15/2012 | Customer Outreach/Communicaitons to assist | YES | | | | | | |
| | | | | MAX | | | | | 0.15\$M | | | | | | | | | | | | | | | | | | |
| | | | | Most Likely | | | | | 0.10\$M | | | | | | | | | | | | | | | | | | |
| | | | | 0 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 4 | | | | | | MIN | | | | | | | | | | | | | 0.0Mo | Insignificant | | | |
| MAX | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Most Likely | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Schedule | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Alternative 2B: Rehabilitation

| Project Title | | Vashon Trestle Preservation (Alt 2B): Refurbishment | | | | | Value | | Variability | | Risk Markups | | WSDOT Escalation tables built-in. | | % | Total Cost CY [\$M] | Total Cost YOE [\$M] | Ad Date | |  | End Construction date | | WSDOT Ovidiu Cretu 360-705-7599 | | | | |
|---|--------|---|------------------|---|---|--|---------|-------------------------|-------------------------|---------|-----------------------|--|-----------------------------------|--|---|---------------------|---|----------------|--------------|---|--|-----|---------------------------------------|------------------|--|------------------|--|
| Estimate Date | | 06/21/12 | | | | Target AD date | | 04/14/14 | | 10% | | Mob | | 10.0% | | A/B/A Duration | | 50 | June 7, 2014 | | 50% | | July 27, 2035 | | | | |
| Project PIN # | | | | The above macro should be activated to generate the final results. Do not stop it if it is running. | | Estimated CN Duration | | 252.0Mo | | 10% | | Tax | | 8.6% | | on-WSDOT rate | | YOE | 60 | July 30, 2014 | | 60% | | October 19, 2035 | | | |
| Last Review Date | | 06/21/12 | | | | Estimated PE Cost | | 3.22 \$M | | 10% | | CE | | 11.0% | | PE | | 3.3\$M | | 70 | August 31, 2014 | | 70% | | | January 14, 2036 | |
| Project Manager | | Charlie Torres | | | | Estimated ROW Cost | | | | 10% | | PE | | 9.1% | | ROW | | 0.0\$M | | 80 | September 25, 2014 | | 80% | | | April 25, 2036 | |
| | | | | | | Estimated CN Cost | | 43.00 \$M | | 10% | | C.O.C | | 4.0% | | CN | | 55.3\$M | | 90 | October 27, 2014 | | 90% | | | August 28, 2036 | |
| The yellow highlighted cells have to be filled in order for macro to run correctly. The light green highlighted cells may be filled if you know what you are doing. !!!!!!! Existing (Pre-Mitigated) Design!!!!!!!!!!!!Created and Maintained by WSDOT, contact Ovidiu Cretu 360-705-7599, ccretuo@wsdot.wa.gov | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Risk Identification | | | | | Quantitative Analysis | | | | | | | Qualitative Display of the Best Guess Impact | | | | | Risk Response Plan | | | Monitoring and Control | | | Critical Issue | | | | |
| Risk # | Status | Dependency | Project Phase | Summary Description Threat and/or Opportunity | Detailed Description of Risk Event (Specific, Measurable, Attributable, Relevant, Timebound) [SMART] | Risk Trigger | Type | Probability/Correlation | Risk Impact (\$M or Mo) | | Expected Impact (\$M) | Probability (%) | Impact | Risk Matrix (Probability of Occurrence by Expected Impact) | | Strategy | ACTION TO BE TAKEN Response Actions including advantages and disadvantages include date | | Risk Owner | Risk Review Dates | Date, Status and Review Comments (Do not delete prior comments, therefore providing a history) | | Is Risk on Critical Path? | | | | |
| (1) | (2) | (3) | (5) | (6) | (7) | (8) | (9) | (10) | [10a] | (11) | (12) | (13) | (14) | (15) | | (16) | (17) | | (18) | (19) | (20) | | (21) | | | | |
| 5 | Active | | Pre-construction | Threat | Project alternative is not fully funded | 30% estimate comes in higher than budget | Cost | 50% | MIN | 0.01\$M | 0.02\$M | Moderate | Very Low | Probability |  | | Plan to scale back project: leave terminal building in place or don't replace all of the outer trestle which is the most vulnerable. | Charlie Torres | 6/15/2012 | Track estimates. Work with Steve Levensgood and discipline leads to develop a more thorough estimate. If we still have insufficient funds, cut scope (don't replace seawall or terminal building?) | YES | | | | | | |
| | | | | MAX | | | 0.05\$M | | | | | | | | | | | | | | | | | | | | |
| | | | | Most Likely | | | 0.03\$M | | | | | | | | | | | | | | | | | | | | |
| | | | | Schedule | | | | Master Duration Risk | | 0.0Mo | Insignificant | | | | | | | | | | | | | | | | |
| MIN | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MAX | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Most Likely | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Active | | Pre-construction | Threat | Recently adapted standards are more difficult and costly to apply. Not doing so results in long term impacts to Operations. | Selection of alternative | Cost | 90% | MIN | 0.05\$M | 0.11\$M | Very High | Very Low | Probability |  | | Work with various agencies and ASDE to develop a plan to satisfy them. May result if follow up mini-projects | Charlie Torres | 6/15/2012 | Reach out to those who have an interest in meeting standards (Operations, ASDE) and talk to them about the project alternative to see if we can find common ground to gain their support | YES | | | | | | |
| | | | | MAX | | | 0.25\$M | | | | | | | | | | | | | | | | | | | | |
| | | | | Most Likely | | | 0.10\$M | | | | | | | | | | | | | | | | | | | | |
| | | | | Schedule | | | | 0 | | 0.0Mo | Insignificant | | | | | | | | | | | | | | | | |
| MIN | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MAX | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Most Likely | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Active | | | | Alternative Selection does not get permitted. Design Team Spends \$3.2M PE budget and has to start all over as project is canceled | Army Corps and/or NOAA notify environmental staff that permit may NOT be forthcoming | Cost | 25% | MIN | 0.00\$M | 0.40\$M | Low | Moderate | Probability |  | | Start all over. Open up new work order. Start new PMP/PDS | | | 6/15/12: The PM and Management may revise the scope of this alternative; they may delete stormwater treatment or replacement of creosote treated timbers as a cost cutting measure. They may only want to seismically | YES | | | | | | |
| | | | | MAX | | | 3.20\$M | | | | | | | | | | | | | | | | | | | | |
| | | | | Most Likely | | | 1.60\$M | | | | | | | | | | | | | | | | | | | | |
| | | | | Schedule | | | | Master Duration Risk | | 0.0Mo | Insignificant | | | | | | | | | | | | | | | | |
| MIN | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MAX | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Most Likely | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Active | | | | Compliance with ESA will require a biological evaluation of the existing habitat and species potentially impacted by the project during and after construction. Marbled Murrelet have impacted pile driving on other projects requiring Contractors to stop work. What about the Giant Plumose Anemone? Also impacts negotiations with tribe for permits. | Environmental process during predesign will provide direction for design and special provisions during construction. | Cost | 50% | MIN | 0.05\$M | 0.08\$M | Moderate | Very Low | Probability |  | | Following field investigations by biologists, use any lessons learned from past projects and/or develop special provisions to include in the contract as part of permit approval process. | | | | YES | | | | | | |
| | | | | MAX | | | 0.25\$M | | | | | | | | | | | | | | | | | | | | |
| | | | | Most Likely | | | 0.15\$M | | | | | | | | | | | | | | | | | | | | |
| | | | | Schedule | | | 8 | 0 | | 0.0Mo | Insignificant | | | | | | | | | | | | | | | | |
| MIN | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MAX | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Most Likely | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | Active | | | | The Governor has a goal of cleaning up toxic chemicals, restoring waterways and salmon habitat, in the Puget Sound in the next 20 years. The refurbishment alternative does not address this issue. | Management asks us to implement an alternative consistent with the initiative | Cost | 20% | MIN | 0.01\$M | 0.00\$M | Low | Insignificant | Probability |  | | Talk to the State Officials about mitigation | | | Coordinate via Management, Confidence Reports, Gary Lebow, Firas Makhoul | YES | | | | | | |
| | | | | MAX | | | 0.03\$M | | | | | | | | | | | | | | | | | | | | |
| | | | | Most Likely | | | 0.02\$M | | | | | | | | | | | | | | | | | | | | |
| | | | | Schedule | | | 0 | Master Duration Risk | | 0.6Mo | Very Low | | | | | | | | | | | | | | | | |
| MIN | 1.0Mo | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MAX | 6.0Mo | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Most Likely | 3.0Mo | | | | | | | | | | | | | | | | | | | | | | | | | | |

Alternative 2B: Rehabilitation

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|-----------------------|------------------|---|---|--|-------------|-------------------------|-------------------------|-----------------------------------|--|---------------------|----------------------|--|--------------------|---|---|---|---------------------------|-------------------|--|-----|---------------------------|--|--|--|--|--|--|--|--|--|--|--|
| Project Title | Vashon Trestle Preservation (Replacement): Partial Replacement | | | | | Value | Variability | Risk Markups | | WSDOT Escalation tables built-in. | % | Total Cost CY [\$M] | Total Cost YOY [\$M] | | Ad Date | ® | End Construction date | WSDOT Ovidiu Cretu 360-705-7599 | | | | | | | | | | | | | | | | |
| Estimate Date | 06/15/12 | Target AD date | | | 04/14/14 | 10% | Mob | 10.0% | A/B/A Duration | | 50 | 47.10 | 60.08 | | December 19, 2014 | 50% | February 11, 2036 | | | | | | | | | | | | | | | | | |
| Project PIN # | | Estimated CN Duration | | | 48.0Mo | 10% | Tax | 8.6% | on-WSDOT rat | YOY | 60 | 48.02 | 61.29 | | May 10, 2015 | 60% | May 17, 2036 | | | | | | | | | | | | | | | | | |
| Last Review Date | 06/15/12 | Estimated PE Cost | | | 3.22 \$M | 10% | CE | 11.0% | PE | | 3.3\$M | 70 | 49.05 | | July 2, 2015 | 70% | August 29, 2036 | | | | | | | | | | | | | | | | | |
| Project Manager | Charlie Torres | Estimated ROW Cost | | | | 10% | PE | 9.1% | ROW | | 0.0\$M | 80 | 50.14 | | August 20, 2015 | 80% | December 25, 2036 | | | | | | | | | | | | | | | | | |
| | | Estimated CN Cost | | | 31.80 \$M | 10% | C.O.C | 4.0% | CN | | 35.6\$M | 90 | 51.53 | | October 17, 2015 | 90% | May 24, 2037 | | | | | | | | | | | | | | | | | |
| The yellow highlighted cells have to be filled in order for macro to run correctly. The light green highlighted cells may be filled if you know what you are doing. !!!!!!! Existing (Pre-Mitigated) Design!!!!!!!!!!!!Created and Maintained by WSDOT, contact Ovidiu Cretu 360-705-7599, cretuo@wsdot.wa.gov | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Risk Identification | | | | | | Quantitative Analysis | | | | | Qualitative Display of the Best Guess Impact | | | | Risk Response Plan | | | | Critical Issue | | | | | | | | | | | | | | | |
| Risk # | Status | Dependency | Project Phase | Summary Description Threat and/or Opportunity | Detailed Description of Risk Event (Specific, Measurable, Attributable, Relevant, Timebound) [SMART] | Risk Trigger | Type | Probability/Correlation | Risk Impact (\$M or Mo) | | Expected Impact (\$M) | Probability (%) | Impact | Risk Matrix (Probability of Occurrence by Expected Impact) | | Strategy | ACTION TO BE TAKEN Response Actions including advantages and disadvantages include date | | Risk Owner | Risk Review Dates | Date, Status and Review Comments (Do not delete prior comments, therefore providing a history) | | Is Risk on Critical Path? | | | | | | | | | | | |
| (1) | (2) | (3) | (5) | (6) | (7) | (8) | (9) | (10) | [10a] | (11) | (12) | (13) | (14) | (15) | | (16) | (17) | | (18) | (19) | (20) | | (21) | | | | | | | | | | | |
| 1 | Active | | Pre-construction | | Compliance with ESA will require a biological evaluation of the existing habitat and species potentially impacted by the project during and after construction. Marbled Murrelet have impacted pile driving on other projects requiring Contractors to stop work. What about the Giant Plumose Anemone? Also impacts negotiations with tribe for permits. | Environmental process during predesign will provide direction for design and special provisions during construction. | Cost | 50% | MIN | 0.05\$M | 0.06\$M | Moderate | Very Low | Probability | VH |  | Mitigation | Following field investigations by biologists, use any lessons learned from past projects and/or develop special provisions to include in the contract as part of permit approval process. | Charlie Torres | 6/15/2012 | Reach out to those who have an interest in meeting standards (Operations, ASDE) and talk to them about the project alternative to see if we can find common ground to gain their support | YES | | | | | | | | | | | | |
| | | | | ESA/MMPA triggers compliance NEW issues that could impact schedule for construction | | | | MAX | 0.25\$M | H | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | Most Likely | 0.10\$M | M | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | Schedule | Negative correlation | Master Duration Risk | | 7.8Mo | | High | L | | | | | | | | | | | | | | | | | | | | |
| 2 | Active | | Pre-construction | Threat | Mitigation will be required for additional overwater coverage. | Selection of alternative | Cost | 50% | MIN | 0.05\$M | 0.05\$M | Moderate | Very Low | Probability | VH |  | Mitigation | Discuss mitigation strategy with TE Management. Plan to mitigate or revise chosen alternative. | Rick Huey | 6/15/2012 | Rick Huey to reach out / partner with NOAA to try get a feel for what they want, how they see the alternative. | YES | | | | | | | | | | | | |
| | | | | | | | | MAX | 0.15\$M | H | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | NOAA opposes the project | | | | Most Likely | 0.10\$M | M | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | Schedule | Negative correlation | 0 | | 1.6Mo | | Very Low | L | | | | | | | | | | | | | | | | | | | | |
| 3 | Active | | Pre-construction | Threat | Accepting Federal Funds will force us to address ADA and stormwater treatment issues. | Selection of alternative | Cost | 25% | MIN | 0.05\$M | 0.03\$M | Low | Very Low | Probability | VH |  | Acceptance | We're choosing an alternative that proposes to meet ADA and stormwater treatment requirements; any additional requirements should be minimal. | Steve Levensgood | 6/15/2012 | PM to work with Steve Levensgood and Ed Barry to come up with an acceptable plan for ADA | YES | | | | | | | | | | | | |
| | | | | | | | | MAX | 0.20\$M | H | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | Federal Funds require additional environmental and ADA considerations. | | | | Most Likely | 0.10\$M | M | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | Schedule | | Master Duration Risk | | 0.0Mo | | Insignificant | L | | | | | | | | | | | | | | | | | | | | |
| 4 | Active | | Pre-construction | Threat | The community is uncomfortable with a partial replacement alternative or with a portion of the project. | Selection of alternative | Cost | 10% | MIN | 0.05\$M | 0.01\$M | Very Low | Very Low | Probability | VH |  | | Tell the community the truth, we don't have the money for the alternative they want. They'll have to continue living with the risk. Revise a small portion of the design as a compromise. | David Mosely/Marta Corsey | 6/15/2012 | Customer Outreach/Communicaitons to assist | YES | | | | | | | | | | | | |
| | | | | | | | | MAX | 0.15\$M | H | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | Vashon Residents oppose Partial Replacement alternative | | | | Most Likely | 0.10\$M | M | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | Schedule | | 0 | | 0.0Mo | | Insignificant | L | | | | | | | | | | | | | | | | | | | | |
| 5 | Active | | Pre-construction | Threat | Project alternative is not fully funded | 30% estimate comes in higher than budget | Cost | 50% | MIN | | 0.00\$M | Moderate | Insignificant | Probability | VH |  | | Plan to scale back project: leave terminal building in place or don't replace all of the outer trestle which is the most vulnerable. Only construct vital link to PO ferry and Slip 1, NOT Slip 2 and the Tie-Up slip | Charlie Torres | 6/15/2012 | Track estimates. Work with Steve Levensgood and discipline leads to develop a more thorough estimate. If we still have insufficient funds, cut scope (don't replace seawall or terminal building?) | YES | | | | | | | | | | | | |
| | | | | | | | | MAX | | H | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | Insufficient funds | | | | Most Likely | | M | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | Schedule | Negative correlation | Master Duration Risk | | 1.6Mo | | Very Low | L | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | MIN | 1.0Mo | | | | VH | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | MAX | 6.0Mo | | | | H | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | Most Likely | 3.0Mo | | | | VL | | | | | | | | | | | | | | | | | | | | |

Alternative 3: Partial Replacement

APPENDIX I

Alternatives Matrix

ALTERNATIVES MATRIX

| Project Element Description | No-Build (Alternative 1) | Rehabilitation (Alternative 2) | Partial Replacement (Alternative 3) | Full Replacement (Alternative 4) |
|----------------------------------|--|---|--|--|
| Description | <ul style="list-style-type: none"> Indefinite deferring of major capital improvements Recurring, small capital maintenance contracts for critical areas Keep trestle minimally functional | <ul style="list-style-type: none"> Minimum work/replacement – shorter life cycle Capital maintenance/repair contracts for 25 years Deferring replacement of major work 20-30 years Keep trestle operationally functional to current service | <ul style="list-style-type: none"> Replace approx. half of existing trestle Replace terminal building Provides “Vital Link” | <ul style="list-style-type: none"> Replacement of timber trestle Same relative overwater footprint |
| Time Frame for Comparison | <ul style="list-style-type: none"> 75 years | <ul style="list-style-type: none"> 75 years | <ul style="list-style-type: none"> 75 years | <ul style="list-style-type: none"> 75 years |
| Life Cycle Cost | <ul style="list-style-type: none"> | <ul style="list-style-type: none"> | <ul style="list-style-type: none"> | <ul style="list-style-type: none"> |
| Cost Benefit Ratio | <ul style="list-style-type: none"> | <ul style="list-style-type: none"> | <ul style="list-style-type: none"> | <ul style="list-style-type: none"> |

| Project Element Description | No-Build (Alternative 1) | Rehabilitation (Alternative 2) | Partial Replacement (Alternative 3) | Full Replacement (Alternative 4) |
|-----------------------------------|---|---|---|--|
| Permitting/ Risk | <ul style="list-style-type: none"> Does not address risk factors No permitting Required | <ul style="list-style-type: none"> Replaces most vulnerable portions of the trestle first Removes creosote piling Provides stormwater treatment Requires recurring or programmatic permit | <ul style="list-style-type: none"> Provides a vital link between shore and vessels Removes creosote piling Provides stormwater treatment Requires Corp permit, HPA, and Building Permit | <ul style="list-style-type: none"> Addresses most risk factors Full funding may not be available Requires Corp permit, HPA, and Building Permit |
| Community/ Business Issues | <ul style="list-style-type: none"> Leaves entire island vulnerable of being disconnected from mainland in event of quake | <ul style="list-style-type: none"> Significant impacts to operations over long time period Slow replacement of trestle leaves significant window of vulnerability Insecure funding for all phases | <ul style="list-style-type: none"> Low impact to operations Provides a vital link to access main land | <ul style="list-style-type: none"> Low impact to operations Positive perception by community to have new facility |

| Project Element Description | No-Build (Alternative 1) | Rehabilitation (Alternative 2) | Partial Replacement (Alternative 3) | Full Replacement (Alternative 4) |
|---------------------------------|--|---|--|---|
| Operations & Traffic | <ul style="list-style-type: none"> No immediate impacts More frequent interruptions with age Possible load restrictions in future would impact trucks, buses, emergency vehicles on structure Possible displacement of vehicles from existing holding areas on structure to streets Possible community/business concerns with service impacts | <ul style="list-style-type: none"> Intermittent impacts with small construction contracts More frequent maintenance contracts Significant impact to operations over 25 year period Reduce operating lanes/ functional slips | <ul style="list-style-type: none"> Revise operational use of structure – HOV lanes, sidewalk width Consistency with future standards in development Staging to maintain operations during construction is important for King Co Passenger Ferry Low impact to operations | <ul style="list-style-type: none"> Revise operational use of structure – HOV lanes, sidewalk width Consistency with future standards in development Maintains existing service levels Staging to maintain operations during construction is important for King Co Passenger Ferry Low impact to operations |
| Maintenance | <ul style="list-style-type: none"> No immediate impacts Continued deterioration of structure Increasing yearly maintenance costs and more frequent inspection | <ul style="list-style-type: none"> Estimated 10 year maintenance interval More recurring maintenance needs Increasing yearly maintenance costs and more frequent inspection | <ul style="list-style-type: none"> Less ongoing maintenance costs Extends life of key elements | <ul style="list-style-type: none"> Highly reduced ongoing maintenance costs Extends life of key elements |

| Project Element Description | No-Build (Alternative 1) | Rehabilitation (Alternative 2) | Partial Replacement (Alternative 3) | Full Replacement (Alternative 4) |
|------------------------------------|---|--|--|--|
| Mechanical & Electrical | <ul style="list-style-type: none"> No immediate impacts Age of mechanical & electrical elements becomes factor in reliability | <ul style="list-style-type: none"> No utilities are replaced More frequent projects to maintain existing use | <ul style="list-style-type: none"> Replaced elements designed to meet terminal standards Replaced elements more reliable | <ul style="list-style-type: none"> Replaced elements designed to meet terminal standards Replaced elements more reliable |
| Structures | <ul style="list-style-type: none"> No immediate impacts Bulkhead/seawall deterioration Does not meet seismic codes | <ul style="list-style-type: none"> Increase of ongoing replacement work as needed Trestle meets seismic Bulkhead not repaired | <ul style="list-style-type: none"> Extended service life of trestle part of trestle consistent with preservation goals New Term. Building | <ul style="list-style-type: none"> Extended service life of trestle consistent with preservation goals New Term. Building |
| Architectural | <ul style="list-style-type: none"> Maintains current terminal building facility Future loss or impact on use as building ages | <ul style="list-style-type: none"> Allows consideration to relocate building as option Staging to maintain operations during construction is important for King Co Passenger Ferry | <ul style="list-style-type: none"> Allows consideration to relocate building as option Staging to maintain operations during construction is important for King Co Passenger Ferry | <ul style="list-style-type: none"> Allows consideration to relocate building as option Staging to maintain operations during construction is important for King Co Passenger Ferry |
| Civil/Drainage | <ul style="list-style-type: none"> Existing facilities do not meet current drainage code requirements | <ul style="list-style-type: none"> Limited options to update facilities to meet standards | <ul style="list-style-type: none"> Brings terminal into compliance with most new standards and local codes | <ul style="list-style-type: none"> Brings terminal into compliance with new standards and local codes |

| Project Element Description | No-Build (Alternative 1) | Rehabilitation (Alternative 2) | Partial Replacement (Alternative 3) | Full Replacement (Alternative 4) |
|-----------------------------|---|--|--|--|
| Environmental | <ul style="list-style-type: none"> No immediate impacts Long term impact of deteriorated piles/timbers in water | <ul style="list-style-type: none"> Recurring permits for small projects to maintain existing facilities Removes creosote timber in stages Provides stormwater treatment | <ul style="list-style-type: none"> Potential impact to negotiations with tribes Removes creosote timber Provides stormwater treatment Fish windows limit in-water work | <ul style="list-style-type: none"> Potential increase of over water coverage and impact to negotiations with tribes Fish windows limit in-water work |
| Construction | <ul style="list-style-type: none"> No immediate impact Small recurring maintenance contracts for critical areas | <ul style="list-style-type: none"> Small construction contracts scheduled for issues 5 total phases over 25 year period | <ul style="list-style-type: none"> Contract and duration 2-3 years | <ul style="list-style-type: none"> Contract and duration 3-4 years |
| Budget & Funding | <ul style="list-style-type: none"> Could give flexibility to reprogram funds budgeted for project | <ul style="list-style-type: none"> Partial use of funds for immediate needs Reprogram maintenance for future years Higher future/ongoing maintenance costs | <ul style="list-style-type: none"> Little to no change with existing funding and budget; however, unmitigated risks could impact final costs | <ul style="list-style-type: none"> Little to no change with existing funding and budget; however, unmitigated risks could impact final costs |